Full Proposal

for the

Doctor of Philosophy in Electrical Engineering

Corresponding to Specializations Currently Offered

in the Existing Degree

Doctor of Philosophy in Engineering

Prepared by
Department of Electrical Engineering
Wright State University
February 2015
Executive Summary

This proposal seeks to establish an independent Ph.D. in Electrical Engineering within the Department of Electrical Engineering of the College of Engineering & Computer Science at Wright State University. Faculty in electrical engineering currently advise students within the interdisciplinary Ph.D. in Engineering program. This program was established less than 20 years ago and has flourished under the leadership of Dr. Ramana Grandhi. As a natural next step in the growth and evolution of doctoral studies in engineering at Wright State University, the faculty in electrical engineering seek to establish an independent Ph.D. program to better serve their doctoral students and continue to grow the volume of doctoral-level study and research at the university.

1 Degree Proposal and Motivation

Wright State University proposes to establish a new Doctor of Philosophy in Electrical Engineering that represents a concentration of faculty from 3 of the 7 focus areas under the existing multidisciplinary Doctor of Philosophy in Engineering degree. The focus areas to be merged are as follows:

- Controls & Robotics
- Electronics, Microwave, VLSI, & Nanotechnology
- Sensor Signal & Image processing
The existing Ph.D. in Engineering produced its first graduate in 1999, and since that time, it has produced a total of 141 with 47 of those graduates advised by faculty in Electrical Engineering. The Ph.D. in Engineering program averages roughly 100 active students per year with 41 students currently active under the advisement of faculty in Electrical Engineering. Hence, the proposed program is already thriving under the current multi-disciplinary degree, and establishing it as an independent degree program would have the following benefits:

- enhancement of our marketing of the degree to students,

*Enrollment in the Ph.D. in Engineering program for electrical engineering faculty is dominated by students that have earned earlier degrees at WSU and by local students. Both of these populations are aware of the program by virtue of proximity. Lack of an electrical engineering brand on the Ph.D. program makes it difficult to market to students outside of the Dayton region. Furthermore, we observe that the WSU Department of Electrical Engineering is not featured in the attached NRC rankings, owing in part to lack of our own independent Ph.D. program, despite our research output relative to peers.*

- permit the development of program requirements and curriculum that is more responsive to student needs, and

*The Ph.D. in Engineering program currently requires core engineering courses outside the field of electrical engineering that are largely of no use to students seeking doctoral-level study in electrical engineering. The Ph.D. in Engineering program also requires 3 semester hours of a seminar course, comprising all focus areas and implying that most of the presented seminars will be for advanced research in areas that are inaccessible to doctoral students in electrical engineering. The proposed program will eliminate these requirements and refocus the curriculum on doctoral-level preparation in electrical engineering.*

- provide graduating students a degree that is more easily marketed to employers.

*The value of a “Ph.D. in Engineering” is not readily apparent to employers, requiring graduating students to explain that their course content and dissertation work largely mimic a Ph.D. in Electrical Engineering. Lacking the opportunity for this explanation students will may be disadvantaged in some employment pursuits or may take the liberty to represent their degree as a “Ph.D. in Electrical Engineering” on the resumes.*

The combination of these benefits should lead to increased student enrollment and improved student outcomes. Faculty and students in this program would already be engaged with a wide variety of research sponsors and employers, for example: AFRL, NASIC, MacAulay-Brown, SAIC/Leidos, Matrix Research & Engineering, Etegent, Defense Research Associates, Defense Engineering Corporation, Northrop Grumman, SET Associates, Raytheon, Boeing, Systems Technology Research, National Science Foundation, Army Research Lab, UDRI, HPTi, Ohio Supercomputer Center, Ohio State University, Alphatech, ATK-Mission Research, and Wright Brothers Institute. Establishing an independent Ph.D. in Electrical Engineering would improve our brand recognition and expand our reach and impact in the local community and nationally.

2 Curriculum Requirements

2.1 Current Program Requirements

The contents of this subsection are excerpted from the web site for the Ph.D. in Engineering program.

To obtain the Ph.D. in Engineering degree, a student must complete an approved Program of Study that contains at least 90 semester graduate credit hours beyond the bachelor's degree in engineering or an equivalent degree, or 60 graduate semester credit hours beyond a Master's degree in engineering.
To meet the 90 semester graduate credit hours required for the Ph.D. in Engineering degree, a student must:

- Complete at least three interdisciplinary core courses and earn a minimum grade of "B" in each course. The core courses are:
  - EGR-7010, Applied Linear Techniques
  - EGR-7020, Systems Engineering and Analysis
  - EGR-7030, Computation Engineering Analysis
  - EGR-7040, Design Optimization
  - EGR-7050, Design and Analysis of Engineering Experiments
- Complete 18 semester credit hours of major courses (7000-level and above) in electrical engineering, biomedical engineering, human factors engineering, mechanical engineering, materials science and engineering, or in a focus area.
- Complete at least 9 semester credit hours of research focus area courses, i.e., graduate courses (6000-level and above). This may include core courses and courses used to satisfy graduate course requirements.
- Complete at least 6 semester credit hours of breadth courses, i.e., graduate courses (6000-level and above) outside the research focus area.
- Complete at least 6 semester credit hours of graduate (6000-level and above) courses in mathematics (MTH) or statistics (STT).
- Complete 3 semester credit hours of EGR 8910, Ph.D. Seminar
- Take no more than 3 semester credit hours of independent study (Course number 7900)
- Complete between 30-40 semester credit hours of dissertation research
- Complete the requirements of the Program Qualification
- Complete the Candidacy Examination satisfactorily
- Complete the Research Proposal Defense satisfactorily
- Present a 50-minute dissertation seminar during an EGR 8910 course meeting
- Submit at least one manuscript to a peer-reviewed journal
- Complete the Dissertation Defense satisfactorily
- Complete the final dissertation satisfactorily, as judged by the student's Dissertation Committee and the Graduate School

Students having non-engineering backgrounds are required to successfully complete the equivalent of the relevant math and science sequences required for an undergraduate engineering degree appropriate for their focus area. These courses cannot be used to satisfy degree requirements.

2.2 Proposed Program Requirements

To obtain the Ph.D. in Electrical Engineering degree, a student must complete an approved Program of Study that contains at least 90 semester graduate credit hours beyond the bachelor's (BS) degree in electrical engineering or an equivalent degree, or 60 graduate semester credit hours beyond a Master's (MS) degree in electrical engineering or a related area. These requirements are consistent with national norms.

In addition to meeting graduate credit hour requirement for the Ph.D. in Electrical Engineering degree, a student must do the following.
Complete at least three EE breadth courses by choosing one course from each of at least three focus areas and earn a minimum grade of "B" in each course along with any associated laboratory component. None of these courses can be duplicative of courses already taken at the undergraduate level. Students originally enrolled in the Ph.D. in Engineering may count engineering core courses, which were completed in spring 2015 or earlier, towards the breadth requirement. Breadth courses must be at the 7000-level or above, although courses at the 6000-level may be permitted with approval from Director of Graduate studies. The Ph.D. in Electrical Engineering focus areas include the following.

- VLSI
- Electronics
- RF & Microwave
- Signal Processing
- Communications
- Controls

Complete 20 semester credit hours of courses numbered 7000-level and above in electrical engineering. Core breadth courses may be included in the 20 semester hours.

- Complete at least 6 semester credit hours of graduate (6000-level and above) courses in mathematics (MTH) or statistics (STT).
- Take no more than 3 semester credit hours of independent study (EE 7900).
- Complete between 30-45 semester credit hours of dissertation research.
- Pass the Program Qualification Exam.

Upon completion of the coursework students are required to pass a qualifier where problem solving and independent research comprehension skills are thoroughly examined by a Ph.D. committee comprised of subject matter experts.

- Pass the Research Proposal Defense.

Upon passing the qualifier, a student is required to survey the literature to master the current state of the art in the student's intended area of research. Based on this study, the student is required to independently develop a novel research plan that proposes to push the envelope of current state of art in research in specific areas in a significant way. The novelty in the research proposal is reviewed, examined and approved by the subject matter experts in the Ph.D. committee.

- Present a seminar based on their dissertation research during an open meeting or conference.
- Submit at least one manuscript to a peer-reviewed (IEEE quality) journal.
- Pass the oral Dissertation Defense and satisfactorily complete the written Dissertation Document

A student is required to submit a comprehensive written report on the new research findings, which must be approved by the dissertation committee. Furthermore, the student is required to give an oral presentation to defend the findings in the written report to a Ph.D. dissertation committee comprised of subject matter experts in the field. If needed, students are required to successfully complete any prerequisite material at the undergraduate level. These courses cannot be used to satisfy Ph.D. degree requirements.

3 Degree administration

The proposed Ph.D. in Electrical Engineering would be administered by the Department of Electrical Engineering within the College of Engineering & Computer Science at Wright State University. The curriculum would be established, assessed, evaluated, and maintained by the department's Graduate Studies Committee, which is chaired by the Director of Graduate Studies. The Department of
Electrical Engineering already has the largest graduate student population at the university with 393 students enrolled in the Master of Science in Electrical Engineering as of fall semester 2014. Therefore, the department will assign a 1/2-time administrative assistant to help support the Ph.D. program, and no administrative support will be sought from the Ph.D. in Engineering program. In addition, all students enrolled in the Ph.D. in Electrical Engineering would be required to have a dissertation advisor, who would naturally assume much of the responsibility in advising a student on defining their program of study and completing degree requirements.

4 Evidence of need

Establishing an independent Ph.D. in Electrical Engineering is a natural next step in the growth of doctoral engineering programs at Wright State University. This is consistent with national, state, and regional drives to increase education in the STEM fields at all levels. The Ohio 3rd Frontier program annually cites technology focus areas for investment in the state of Ohio. The list for 2014 included the following topics that would be impacted by a Ph.D. in Electrical Engineering: advanced materials, aeropropulsion power management, fuel cells & energy storage, medical technology, sensing & automation, and situational awareness & surveillance. Research within the Department of Electrical Engineering has historically touched on all of these areas, and establishment of an independent Ph.D. in Electrical Engineering would facilitate growth of student enrollment in these and supporting technology areas and would facilitate the attraction of faculty and industry partners in these areas.

We also note the close proximity of Wright-Patterson Air Force Base, the largest employer in Ohio, which houses the Air Force Research Laboratory, the National Air & Space Intelligence Center, and several major program offices. These government facilities have attracted and sustained a surrounding ecosystem of support contractors. The combined government and private employers have substantial historical and ongoing needs for students trained in electrical engineering with advanced degrees. This is demonstrated by the large number of graduates from the Ph.D. in Electrical Engineering that are employed in the local community as listed in the table below.
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<th>Advisor</th>
<th>Year</th>
<th>First</th>
<th>Last</th>
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* Not reported – faculty member on leave
4.1 Historical Data

Faculty within the Department of Electrical Engineering have been consistent and strong participants in the Ph.D. in Engineering program, and we expect this level of engagement to only improve with the establishment of an independent Ph.D. in Electrical Engineering that can be more directly tailored to student needs and faculty interests. As shown in the graph below, faculty in electrical engineering advised the first graduate of the Ph.D. in Engineering and continued to actively advise students, at time accounting for more than have of the graduates in a given year, even after the program had become well established.

5 Prospective enrollment

5.1 Target Enrollment

Our initial enrollment plan will be to sustain the current level of student enrollment, which includes 41 students that were actively registered during 2014. Through curriculum improvements, marketing, and outreach, we will seek to reach a target sustained enrollment level that is 50\% greater, 60 actively registered students per year.

5.2 Admission Criteria

Students entering the Ph.D. in Electrical Engineering program must have an awarded M.S. degree in Electrical Engineering or a closely related field. Students with M.S. degrees in (non-electrical) engineering fields will frequently begin graduate-level coursework without remediation. Students from other STEM fields (e.g., mathematics, physics, computer science) may be required to complete some remedial coursework before beginning graduate-level studies.

Program admissions will be based on a completed application of background information, submitted transcripts for undergraduate coursework and prior graduate coursework, GRE scores, 3 letters of recommendation, and a written statement of research interests and objectives. International students will also need to submit scores measuring proficiency with the English language (e.g., TOEFL, IELTS).

Students must first satisfy requirements for admission into the Wright State University Graduate School (Graduate GPA $\geq 3.0$, TOEFL $\geq 79$ or IELTS $\geq 6.0$). Subsequently, admission decisions will be made by the graduate program director based on the complete application package. Admission guidelines for academic criteria will generally be as follows.

1. Student GPA for prior graduate coursework should not be lower than 3.5.
2. Student GRE (math) score should not be lower than 155, and the student GRE composite score should not be lower than 300.

3. International student test scores for proficiency with the English language should not be lower than 79 for the TOEFL and should not be lower than 6.5 for the IELTS.

Prior work experience may improve an applicant's chances for admission but will not be considered as a substitute for required academic credentials.

5.3 Student recruitment

Enrollment in focus areas of the Ph.D. in Engineering that are associated with electrical engineering are already strong as shown earlier in this proposal. This enrollment is driven by 3 student populations: international, alum of WSU undergraduate programs, and people working in local government and industry, and we expect the same driving populations within the Ph.D. in Electrical Engineering. Thus far, extensive efforts in student recruitment have not been required, as the program is well-known within the local employer community and students in B.S. and M.S. degree programs are already recruited into the Ph.D. program with great frequency. At this time, no special marketing or recruiting effort is planned for the Ph.D. in Electrical Engineering on an ongoing basis. Necessarily, there will be some effort placed in publicity during the initial transition from participation in the Ph.D. in Engineering program.

6 Effort to enroll and retain underrepresented groups

The College of Engineering & Computer Science has already been long engaged in efforts to recruit underrepresented groups, most notably minorities and women, to engineering programs. The table below shows the current level of engagement of these groups in existing engineering programs. The Ph.D. in Electrical Engineering will continue to engage in college-led activities towards recruiting underrepresented groups to at least maintain this level of engagement.

<table>
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<th>Enrollment Category</th>
<th>Minorities</th>
<th>Women</th>
<th>Total Enrollment</th>
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<td>Undergraduate Engineering &amp; Computer Science</td>
<td>384 (16%)</td>
<td>366 (15%)</td>
<td>2408</td>
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<tr>
<td>B.S. in Electrical Engineering</td>
<td>52 (17%)</td>
<td>*</td>
<td>304</td>
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<tr>
<td>Graduate Engineering &amp; Computer Science (M.S.)</td>
<td>52 (6%)</td>
<td>246 (28%)</td>
<td>889</td>
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<tr>
<td>M.S. in Electrical Engineering</td>
<td>15 (22%)</td>
<td>*</td>
<td>393 (includes 325 international)</td>
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<tr>
<td>Ph.D. in Engineering</td>
<td>11 (13%)</td>
<td>*</td>
<td>84</td>
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* Not reported

Enrollment in the Ph.D. in Engineering is primarily driven by 3 student populations: international, alum of WSU undergraduate programs, and people working in local government and industry, and we expect the same driving populations within the Ph.D. in Electrical Engineering. Hence, the program's demographics among students from the US will be driven primarily by the local working population and our undergraduate enrollment. As we continue to pursue greater engagement of underrepresented groups in our undergraduate programs, we expect the presence of these groups within the Ph.D. in Electrical Engineering to likewise grow.

As an additional effort to grow engagement of underrepresented groups and recruit from outside the WSU community, we will seek to recruit McNair scholars. McNair Scholars is a U.S. Department of
Education program to increase the enrollment of underrepresented groups in doctoral studies. Every year, the WSU Graduate School receives a list of McNair Scholars from the Council of Graduate Schools. The Electrical Engineering Graduate Studies Committee will look within this list for students interested in electrical engineering to be contacted for recruitment.

7 Faculty and facilities

7.1 Faculty

All faculty within the Department of Electrical Engineering have been awarded terminal degrees. Their degree credentials and research areas are listed below.

- **Josh Ash**, Assistant Professor, Ph.D., The Ohio State University, 2007. Research interests: sensor signal and image processing.
- **Elliott Brown** (joint appointment with Physics), Professor, Ph.D., California Institute of Technology, 1985. Research interests: mmwave and THz mixers made from semiconductor hot-electron bolometers and magnetically-quantized photoconductors.
- **Henry Chen**, Professor, Ph.D., University of Minnesota, 1989. Research interests: VLSI/FPGA/GPU based on demand targeted to CMOS nanotechnologies which includes digital, analog and mixed-signal integrated circuits for signal processing, communication, radar and ultra wideband receivers.
- **Jason Deibel** (joint appointment with Physics), Associate Professor, Ph.D., University of Michigan, 2004. Research interests: terahertz and optical physics.
- **John (Marty) Emmert**, Professor, Ph.D., University of Cincinnati, 1999. Research interests: physical design automation for VLSI, VLSI systems, physical VLSI design, reconfigurable systems, digital CD, VHSIC hardware description language (VHDL), verilog, digital design, VLSI interconnections, analog integrated circuit design, signal processing, digital control systems.
- **Fred Garber**, Associate Professor, Ph.D., University of Illinois, 1983. Research interests: communication systems, target recognition, information theory, and pattern theory.
- **Steve Gorman**, Instructor, Ph.D., University of Kentucky, 1988. Research interest: signal and communication processing related to geolocation of modern signal transmitters including cellular and PC devices.
- **Lang Hong**, Professor, Ph.D., University of Tennessee, 1989. Research interests: computer vision, image processing and pattern recognition, robotic sensing and control, multisensor systems, stochastic systems, system modeling and estimation, and multitarget tracking.
- **Marian Kazimierczuk**, Professor, Ph.D., Technical University of Warsaw, 1978. Research interests: electronic circuit analysis, high-frequency tuned power amplifiers, power electronics, dc-dc PWM and resonant power converters, modeling and control of power converters, magnetic components, and renewable energy sources.
- **Pradeep Misra**, Associate Professor, Ph.D., Concordia University, 1987. Research interests: multivariable control theory, robotics and applied numerical analysis.
- **Doug Petkie** (joint appointment with Physics), Associate Professor, Ph.D., The Ohio State University, 1996. Research: spectroscopy of atmospheric and interstellar related molecules, microwave, mm-wave, and THz sensing and imaging.
- **Teri Piatt**, Lecturer, Ph.D., University of Colorado, 1999. Research interests: technical communications, circuits, linear systems, and control systems.
• **Kuldip Rattan**, Professor Emeritus, Ph.D., University of Kentucky, 1975. Research interests: control theory, robotics, verification and validation of cyber-physical systems (CPS).

• **Saizhu Ren**, Associate Professor, Ph.D., Wright State University, 2008. Research interests: RF and mixed signal integrated circuit design with applications to wireless transceivers, communications and signal processing.

• **Brian Rigling**, Professor and Chair, Ph.D., The Ohio State University, 2003. Research interests: sensor signal and image processing, system engineering and modeling.

• **Michael A. Saville**, Assistant Professor, Ph.D., P.E., University of Illinois at Urbana-Champaign, Illinois, 2006. Research interests: computational and applied electromagnetics, radar measurement and physics-based modeling of sensor signal processing.

• **Arnab Shaw**, Professor, Ph.D., University of Rhode Island, 1987. Research interests: sensor signal and image processing, automatic target recognition, hyperspectral image processing, high resolution angles of arrival estimation, and vibrometry based target recognition.


• **Zhiqiang (John) Wu**, Associate Professor, Ph.D., Colorado State University, 2002. Research interests: wireless communication and networking, cognitive radio and dynamic spectrum access, cognitive RF, multi-carrier transmission, underwater acoustic communication.

• **Jiafeng Xie**, Assistant Professor, Ph.D., University of Pittsburgh, 2014. Research interests: cryptographic VLSI.

• **Kefu Xue**, Associate Professor, Ph.D., Pennsylvania State University, 1987. Research interests: digital image processing, computer vision and special purpose architecture for signal processing.

• **Xiaodong (Frank) Zhang**, Associate Professor, Ph.D., University of Cincinnati, 2001. Research interests: Fault diagnosis and prognosis, fault-tolerant control and contingency management, intelligent control and adaptive systems, distributed and cooperative control, verification and validation of complex control systems.

• **Yan Zhuang**, Associate Professor, Ph.D., Johannes Kepler University, Linz, Austria, 2000. Research interests: RF and microwave technology, magnetic materials, nano-composite materials, high speed Si-based electronics, MEMs/NEMs, micro aerial vehicle and sensors.

7.2 Facilities

The Ph.D. in Electrical Engineering will be supported by resources at the department, college, and university level, unchanged from those leveraged under the Ph.D. in Engineering. These include laboratory spaces assigned on a per faculty member basis by the department, computing and laboratory support provided by the College of Engineering & Computer Science computing staff, dedicated servers and computer labs maintained by the College of Engineering & Computer Science, and on-line and physical library resources, including electronic subscriptions to SPIE Digital Library and IEEEExplore.

8 Need for additional facilities and staff
As this degree program is being established based on components of an existing multidisciplinary degree program, and as the Department of Electrical Engineering is already in the practice of supporting a substantial graduate student population, any additional resources required for an independent Ph.D. in Electrical Engineering will be negligible.

9 Projected additional costs

No additional costs are expected to establish the Ph.D. in Electrical Engineering.
Appendix 1 – Electrical Engineering Course Descriptions

EE 6000 Linear Systems II: Discrete time signals and systems, the z-Transform, input/output theory and discrete Fourier transform, IIR and FIR filter design, relationships, and sampling.

EE 6100 Nano-Fabrication of Integrated Solid State Devices: History, design, and fabrication of CMOS and micro-electro-mechanical systems (MEMS). Typical fabrication methods cover CMOS, front-end-of-line (FEOL), back-end-of-line (BEOL), surface and bulk micromachining. Typical VLSI devices and selected RF MEMS are covered.

EE 6120 Industrial Controls and Automation: Working knowledge of industrial controls and automation. Focus is on developing an understanding of wiring diagram creation, hardware selection, and programmable logic controller design and operation.

EE 6130 Continuous Control Systems: Introductory course providing students with a general control background. Major topics include block diagrams and signal-flow graphs, electromechanical modeling, time response, root locus, and design of PID controllers.

EE 6170 Digital Control Systems: Samples spectra and aliasing, analysis and design of digital control systems using root locus and transform techniques, discrete equivalents of continuous controller and quantization effects.

EE 6190 Introduction to Intelligent Control Systems: Foundations of fuzzy set theory, system modeling using fuzzy rules, structure of fuzzy controllers and PID fuzzy controller design. Also included are neural network foundations, single layered/multi-layered perceptions, learning rules, basics of adaptive controls and adaptive neural control.

EE 6210 Digital Communication: Topics include: analog communication vs digital communication, source coding, pulse shaping, digital modulation/demodulation, signal detection and optimal receiver, simulation of digital communication system is an integral part of this course.

EE 6360 Digital Signal Processing: Theory, Application and Implementation: Introduces principles and applications of digital signal processing (DSP) from the design and implementation perspective. Introduction to advanced digital signal processing design concepts. Focus on time and frequency domain algorithms. Methods include multirate signal processing. Filter banks, time-frequency analysis, and wavelets.

EE 6400 Nanoscience and Nanotechnology: Introduction to nanoengineering, nanoscience and nanotechnology. Topics include introduction to quantum mechanics, fabrication, characterization, materials, electronic properties, optical properties, magnetic properties, devices, MEMS, NEMS.

EE 6420 Microwave Engineering I - Passive Components: Transmission line theory and application wave propagation in rectangular waveguides, microwave network analysis, matching network, design of microwave filter and resonator, and introduction of electromagnetic compatibility.

EE 6440 Electronic Integrated Systems: Theory and applications of linear integrated circuits. Topics include bipolar and field effect transistor analysis and design, multi-stage and feedback amplifiers, ideal and real operational amplifiers, frequency response and compensation, active filters, comparators, and waveform generators.

EE 6460 Microwave Engineering II - Active Components and Circuits: Fundamental of RF active components; Design impedance matching network; microwave transistor amplifier design; Microwave transistor oscillator and mixer design; Introduction to microwave systems.

EE 6470 Antenna Theory and Design: Linear dipole antennas, antenna arrays, thin-wire antennas, moment method analysis examples (vee dipole, folded dipole, etc.), and broadband and frequency-independent antennas. Computer-aided design and analysis of wire antennas, feed networks, and antenna arrays using antenna CAD software.
EE 6540 Very Large Scale Integrated Circuit Design: Introduction to VLSI system design. Topics include CMOS devices and circuit design techniques, basic building blocks for CMOS design, fabrication processing and design rules, chip planning and layout, system timing and power dissipation, simulation for VLSI design, and signal processing with VLSI.

EE 6560 Introduction to Robotics: An introduction to the mathematics of robots. Topics covered include coordinate systems and transformations, manipulator kinematics and inverse kinematics, Jacobians, dynamic and trajectory planning.

EE 6600 Autonomous UAV Flight Control: Introductory course of UAV autopilot design. Major topics include quadrotor dynamics and modeling, UAV sensors, stabilization and control of altitude, pitch/roll, and yaw, position navigation using orientation angles, waypoint navigation, integration and practical issues.

EE 6620 Digital Integrated Circuit Design with PLDs and FPGAs: Digital design with behavioral level VHDL; application of VHDL to the design, analysis, and synthesis of digital integrated circuits; field programmable gate arrays (FPGAs); and design and application of digital integrated circuits using FPGAs. CAD tools, devices, and boards will be used in lab portion of the course. Topics include registers, counters, memory devices, register-level design, microcomputer system organization. Students must show competency in the design of digital systems.

EE 6700 MEMS and Sensors: Overview of basic sensor technology to provide the engineering student with practical working knowledge of sensors. Course will include basic operating principles, basic electronics and measurement principles.

EE 6730 Wireless Communication: Overview on various topics of wireless communication. Topics include cellular network concept, wireless communication channel and multi-path fading, digital modulation/demodulation techniques for wireless communication, performance analysis, equalization, diversity, and RAKE receiver, spreading spectrum technology and CDMA, cognitive radio and dynamic spectrum access, and wireless communication system simulation.

EE 6750 Introduction to Radar Systems: Introductory study of the radar equation, antenna patterns, target cross sections and system losses, radar measurements, pulse doppler and coherent techniques, detection probability and signal-to-noise ratio, sidelobe clutter, synthetic arrays, and pulse compression techniques.

EE 6840 Introduction to Machine Learning: Introduction to the field of probabilistic machine learning. Examples are drawn from sensor signal exploitation, biology, text processing, computer vision, and robotics. Key techniques are demonstrated and implemented in MATLAB.

EE 7010 Applied Linear Techniques: Graduate level linear engineering methods in finite and infinite dimensions.

EE 7020 Modern Control I: State variable representations of continuous and discrete systems. Linear vector spaces and similarity transformations; eigen-analysis, time and transform domain solutions of linear state equations; controllability, observability, and stability of linear systems.

EE 7080 Advanced Micro-Electro-Mechanical Systems (MEMS): Classical and advanced micro-sensing and actuation methods. Analytical and finite element methods utilized in investigating MEMS with computed results compared to published experimental data findings. Topics covered include bio-MEMS and microfluidics.

EE 7150 Digital Image Processing: Image representation, sampling/quantization, spatial/frequency concepts, image enhancement, color image theory, unitary image transforms, image data compression, image models, image coding, image restoration, feature extraction and description, and computer implementation of concepts and algorithms introduced.

**EE 7170 Target Tracking and Data Association**: Multitarget tracking and data association. Linear and nonlinear state estimation. Maneuvering targets. Single target and multitarget tracking in clutter. Joint probabilistic data association filter. Multiple hypothesis and distributed multitarget tracking. Track-to-track fusion.

**EE 7200 Modern Control II**: Analysis and design of digital control systems using the state approach, multirate digital control systems, and digital state observer and microprocessor control.

**EE 7270 Adaptive Control**: The goal of this course is to provide a rigorous introduction to the exciting world of adaptive/self-tuning systems and the application of adaptive techniques to control of dynamic systems with parametric uncertainty. Students will develop first-hand experience in the use of adaptive control techniques via computer simulations.

**EE 7280 Intelligent Control**: The course focuses on providing an introduction to the emerging area of intelligent control methods and their applications to the control and health monitoring of uncertain, complex dynamical systems. An additional goal is the development of the foundational tools needed for pursuing independent research, giving oral presentations, and producing written reports.

**EE 7330 Modern Radar Theory**: Application of probability and random process to the performance characterization of range/doppler radar. Development of the concepts of resolution, S/N, ambiguity function, and pulse compression, and their applications to radar systems design. Consideration is also given to coherent imaging radar.

**EE 7350 Wireless Communication Techniques**: The goal of this course is to provide students with a comprehensive and in-depth understanding of the frontier of modern wireless communication technologies. Topics include: uniqueness and difficulty of wireless communication system design, wireless communication channel and propagation model, modulation and demodulation techniques for mobile communication, multiple access technologies, wireless communicaton system simulation, etc.

**EE 7360 Advanced Wireless Communication Techniques**: Fading Counteraction including ISI mitigation and Adaptive Equalization, Diversity, Coding and Interleaving for error correction, Speech Coding, Multiplexing and Multiple Access techniques including TDMA, FDMA, and CDMA; OFDM, CDMA, Wireless Networking, Packet Radio, Wireless LAN's including Bluetooth.

**EE 7400 Information Theory**: Development of communication channel model and use of information theory as means of quantifying that model. Investigation of various error correcting and detecting codes. The popular Viterbi coding algorithm is also covered.

**EE 7410 Power Electronics I**: Silicon and silicon carbide power devices; Fast-recovery, ultra-fast-recovery, and p-n junctions and Schottky power diodes; performance parameters; Power MOSFETs and IGBTs; static and dynamice characteristics; voltage and current stress; Pulse-width modulated (PWM) DC-DC power converts: topologies of power stages of power converters, such buck-boost, flyback, forward, half bridger, full-bridge, and push-pull power stages.

**EE 7420 Power Electronics II**: Modeling, linearization, and control of open-loop power stages of PWM DC-DC power converters, voltage-mode and current mode control techniques of PWM power converters, DC and AC, steady-state, and transient performance of open-loop and closed-loop power converters.
EE 7430 High Frequency Magnetic Components: This course will cover topics in the area of high-frequency power magnetic components, such as inductors and transformers. Concepts that will be studied: such as complex permeability, eddy currents, skin effect, proximity effect, winding losses, Dowell’s equation, core losses, self-capacitance, area-product method, core-geometry method, integrated inductors. Optimization of conductor dimensions will be performed. Design procedures of high-frequency inductors and transformers will be presented.

EE 7440 RF Power Amplifiers: The course covers the fundamental theory of radio frequency (RF) power amplifiers and their applications in wireless communications, radars, and radio and TV broadcasting. RF power passive and active devices are discussed.

EE 7460 Advanced Electromagnetics Engineering: Understand the physical and engineering principles of electromagnetic wave propagation, radiation and scattering; understand electro-dynamic forms of Maxwell's equations and the associated mathematical models and analysis methods; understand application of Maxwell's equations to engineering problems in radiation and scattering.

EE 7470 Electromagnetic Simulation Methods: Direct solution of Maxwell's differential equations in the time domain using the finite-difference time-domain (FTDT) method. Absorbing boundary conditions and waveguide or plane wave excitation methods. Application to the solution of problems relevant to radiation, radar cross section (or scattering) and microwave circuit design. Wave equation and integral implementation. Application of one-and two-dimensional EM problems. Comparison with the finite element method.

EE 7480 Advanced Microwave Engineering: Concepts and fundamental principles of advanced high-speed electronic devices operating at frequencies greater than 1 GHz, including MESFET, HEMT, RF MOSFET, HBT, and carbon electronics. Models and discussions of semiconductor devices fabricated in a variety of material systems, such as strained Si, III-V compound semiconductors, Si-Ge, CNT and graphene. A description of advanced optoelectronic devices including light-emitting diodes, semiconductor lasers and photovoltaic systems (solar cell).

EE 7520 Low Power VLSI System Design: CMOS VLSI subsystems and low-power subsystems design. Includes data path operators for FIR and IIR filter design: counters, high-speed adders, multipliers, and memory elements.

EE 7530 VLSI Design Synthesis and Optimization: VLSI Synthesis and optimization including data path synthesis, glue logic synthesis control-unit synthesis, and resource sharing. Covers behavioral level to layout level synthesis and corresponding algorithms.

EE 7540 VLSI Testing and Design for Testability: Design for testability of VLSI circuits. Topics include importance of testing, conventional test methods, built-in test, CAD tools for evaluating testability, test pattern generators and compressors; and test for mixed-signal systems and systems-on-a-chip (SOC).

EE 7550 Trust in Integrated Circuit Design: This course will cover topics in "Trust for Integrated Circuit Design." We will explore the problem of Trust at each level of the Integrated circuit design process, from high level simulation all the way to layout, fabrication, and packaging.

EE 7560 Advanced Robotics: Detailed study of the dynamics and control of robotic systems and robot programming languages and systems. Material covered includes rigid-body dynamics; linear, nonlinear, adaptive, and force control of manipulators; and robot programming languages. Sensors, low-level and higher level vision techniques, task planning including obstacle avoidance and artificial intelligence and expert systems as applied to robotic systems.

EE 7580 CMOS Mixed Signal IC Design: Introduction to the techniques, limitations, and problems in the design of CMOS analog integrated circuits. Topics include CMOS analog circuit modeling and device characterization, analog CMOS subcircuits, CMOS amplifiers, CMOS comparators, and
CMOS Op Amps, CMOS Analog to Digital Converters, and CMOS Digital to Analog Converters, and Switched Capacitor Circuits.

EE 7590 CMOS Radio Frequency Integrated Circuit Design: Introduction to the design of Radio Frequency Integrated Circuits using CMOS technology. Topics include S-parameters, noise sources in RF Integrated Circuits, low noise RF amplifiers, RF mixers, RF oscillators and synthesizers, phase lock loops and phase noise.


EE 7620 Detection, Estimation, and Optimal Filter Theory: Binary detection with single/multiple observations, linear minimum mean-square error filtering: Wiener and Kalman filters, MLE and MAP estimators, histogram, tests of hypotheses, regression analysis, model-free and model-based parameter estimation of random processes.

EE 7630 Stochastic Signal Processing: Processing, techniques for stochastic signals. Parametric and nonparametric spectral estimation. Introduction to adaptive systems, to adaptation with stationary signals, and to adaptive algorithms and structures.
Appendix 2 – Electrical Engineering Faculty

See attached.
Joshua N. Ash

Dept. of Electrical Eng.
Wright State University
3640 Colonel Glenn Hwy
Dayton, OH 45435

josh.ash@wright.edu
(937) 775-3983

EDUCATION
○ Ph.D. in Electrical and Computer Engineering, Dec. 2007
  The Ohio State University, Columbus, OH.
  Dissertation: On Singular Estimation Problems in Sensor Localization Systems
  Dissertation committee: Randolph L. Moses (chair), Lee C. Potter, Jose B. Cruz, Alfred O.
  Hero III (Univ. of Michigan)
○ M.Sc. in Electrical Engineering, May 2003.
  Washington University, Saint Louis, MO.
  Research: Resource Allocation in Wireless Multirate DS-CDMA Ad-hoc Networks
○ B.Sc. in Electrical Engineering, May 1998.
  Washington University, Saint Louis, MO.
○ B.Sc. in Physics, May 1998.
  Washington University, Saint Louis, MO.

AWARDS AND HONORS
○ Best Paper Award, IEEE Signal Processing Society, 2009
○ MIT Lincoln Laboratory Graduate Fellowship, 2005–2007
○ The Electrical Engineering Award for Technical Achievement, Washington University, 1998
○ IEEE Chapter Black Box Award, Washington University, 1998
○ Dean’s Honorary Scholarship, Washington University, 1994–1998
○ National Science Foundation Scholarship, 1994–1996

PROFESSIONAL EXPERIENCE
○ Assistant Professor, Jan. 2015–present
  Department of Electrical Engineering, Wright State University, Dayton, OH
  Research and student instruction in statistical signal processing and large-scale sensor systems, including synthetic aperture radar and hyperspectral imagery.
  Institute for Sensing Systems, Ohio State University.
  Basic research in statistical signal processing, statistical modeling and geometric interpretations of information. Application areas include sparse reconstruction, synthetic aperture radar, hyperspectral imagery, sensor networks, and computational biology.
  Etegent Technologies, Cincinnati, OH
  Feature-learning strategies along with an adaptive and hierarchical classification framework for automated target recognition using synthetic aperture radar.
Postdoctoral Researcher, Jan. 2008–Sept. 2010
Institute for Sensing Systems, Ohio State University.
Developed a novel real-time imaging algorithm for synthetic-aperture radar; performed research on robust time-delay estimation in the presence of signal warping and inhomogeneous media; and developed regularization methods and estimators of single-cell gene response functions from heterogeneous cell populations.

Graduate Research Associate, 2003–2007
Information Processing Systems Laboratory, Ohio State University.
Performed research in statistical signal processing for inference in sensor networks, including the development of novel algorithms and performance metrics for sensor and target localization. Performed hardware and software development to support a wireless sensor network test-bed and conducted field experiments using acoustic and radio frequency modalities.

Consultant, 2003–2004
Nova Engineering, Cincinnati, OH
Developed a performance prediction engine for a network-based acoustic localization system; included evaluations of design alternatives, performance bounds, and terrain and atmospheric propagation impacts.

Member Technical Staff, 2000–2002
Celox Networks, Saint Louis, MO
Designed algorithms, developed software, and conducted software performance optimizations in C for distributed processors in a carrier-scale network aggregation router. Performed all phases of software development including high-level design, detailed design, implementation, unit test, system integration, and support.

Graduate Research Assistant, 1998–2000
Research Group in Telecommunications, Washington University.
Created a novel Medium Access Control (MAC) protocol for wireless ad-hoc networks based on multi-rate CDMA. Designed and implemented a network simulator to analyze and advance the above new protocol. Performed comparative analysis between competing multiple access protocols in ad-hoc networks.

Undergraduate Research Assistant, 1996–1998
Magnetics and Information Science Center, Washington University.
Studied, through experiment, the migration and reversibility patterns of bit-cells and grains in magnetic media with the application of DC erase fields. Designed and executed experiments to investigate the effects of azimuthal head angle variation with magnetic media to develop improved interaction models. Custom software was developed for adaptive experiment design.

Instructor, Spring 2015
EE7620: Detection, Estimation, and Optimal Filter Theory (24 Graduate students)
Department of Electrical Engineering, Wright State University, Columbus, OH
Binary detection with single/multiple observations, linear minimum mean-square error filtering: Wiener and Kalman filters, MLE and MAP estimators, histogram, tests of hypotheses, regression analysis, model-free and model-based parameter estimation of random processes.

Instructor, Fall 2014
ECE3050: Signals and Systems (40 Undergraduate students)
Department of Electrical and Computer Engineering, Ohio State University, Columbus, OH
Linear systems and models; convolution; Fourier series and transform; Laplace transform; frequency response; z-transform; feedback.

Instructor, Winter 2003
ECE309: Electrical Circuits Lab (44 Undergraduate students)
Department of Electrical and Computer Engineering, Ohio State University, Columbus, OH
AC and DC circuits; transducers; operational amplifiers; frequency response; active filters; AM modulation.
Student Evaluations of Instructor
Sampling of student comments from Ohio State University’s system for enrolled students to provide anonymous evaluations of instructors. Full student evaluations available upon request.

- “Very helpful instructor”
- “Very prepared, knew the material, and was very helpful”
- “Interested in helping students, quick email responses”
- “Encouraged students to figure out hard problems for themselves”
- “Made students think, explained subject matter clearly”
- “Super human”

Guest Lecturer
Department of Electrical and Computer Engineering, Ohio State University, Columbus, OH
Gave numerous guest lectures in the following courses at Ohio State University

- ECE291: Introduction to Electrical and Computer Engineering
- ECE501: Introduction to Analog and Digital Communications
- ECE600: Introduction to Digital Signal Processing
- ECE2100: Electrical and Computer Engineering II

Head Grader, 1999–2000
Department of Electrical Engineering, Washington University, Saint Louis, MO
Responsible for the grading and consulting of all EE courses offered at Washington University. Included interviewing and hiring of graders.

Graduate Student Advising
Department of Electrical and Computer Engineering, Ohio State University, Columbus, OH
Co-advised (with R. Moses) the following ECE graduate students:

- A. Fasih, Ph.D. student, Characterization and imaging of moving targets using synthetic aperture radar.
- C. Austin, Ph.D. student, Applications of sparse reconstruction in continuous estimation problems.
- J. Meola, Ph.D. student, Atmospheric modeling and atmosphere-invariant change detection in hyperspectral imagery.
- A. Boytim, M.S./Ph.D. student, Spatial-temporal statistical analysis of aeroacoustic propagation in inhomogeneous media.

Undergraduate Student Advising (research projects)
Department of Electrical and Computer Engineering, Ohio State University, Columbus, OH

- D. Stein, Graduated June 2010, Characterization of cross-talk in a consumer recording system
- S. Winfree, Graduated June 2007, Honors Thesis: “Angle of arrival estimation using received signal strength with directional antennas” (Co-advised with L. Potter)
Joshua N. Ash

**Journal Publications and Book Chapters**

Names preceded by * are student advisees/co-advisees of J. Ash.


Joshua N. Ash

→ 847 total citations, ISI Web of Knowledge (as of 9/26/2014)


◊ Conference Publications

Names preceded by * are student advisees/co-advisees of J. Ash.


Joshua N. Ash


→ 22% acceptance.


◇ Other Publications


Invited Talks and Conference Presentations (without proceedings)


Funding

Professional Memberships

- IEEE
- Tau Beta Pi

Service

- Session Chair, SPIE Algorithms for Synthetic Aperture Radar: *Exploitation of Motion*, Baltimore, MD, May 1, 2013
- Session Chair, SPIE Algorithms for Synthetic Aperture Radar: *Image Formation*, Baltimore, MD, May 1, 2013
- Session Chair, SPIE Algorithms for Synthetic Aperture Radar: *Exploitation of Motion*, Baltimore, MD, April 26, 2012
- Graduate student representative on Chair Search Committee for the Dept. of Electrical and Computer Eng., Ohio State Univ., Spring 2006.

Journal reviewer:
- IEEE Transactions on Signal Processing
- IEEE Transactions on Image Processing
- IEEE Transactions on Computers
- IEEE Signal Processing Letters
- IEEE Communications Letters
- IET Electronics Letters
- IET Research Journal in Signal Processing
- Elsevier Journal of Electronics and Communications
- Elsevier International Journal of Signal Processing
- EURASIP Journal on Wireless Communications and Networking
- ISIF Journal of Advances in Information Fusion
EDUCATION

<table>
<thead>
<tr>
<th>Institution</th>
<th>Concentration</th>
<th>Degree/Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>The University of Minnesota, Minneapolis</td>
<td>EE</td>
<td>Ph.D., 1989</td>
</tr>
<tr>
<td>The University of Iowa, Iowa City</td>
<td>EE</td>
<td>M.S., 1986</td>
</tr>
<tr>
<td>National Taiwan University, Taipei, Taiwan</td>
<td>EE</td>
<td>B.S., 1981</td>
</tr>
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</table>

ACADEMIC EXPERIENCE

<table>
<thead>
<tr>
<th>Institution/Organization</th>
<th>Position</th>
<th>Dates</th>
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</thead>
<tbody>
<tr>
<td>Wright State University, Dayton, Ohio</td>
<td>Professor</td>
<td>2000-present</td>
</tr>
<tr>
<td>Wright State University, Dayton, Ohio</td>
<td>Associate Professor</td>
<td>1995-2000</td>
</tr>
<tr>
<td>Wright State University, Dayton, Ohio</td>
<td>Assistant Professor</td>
<td>1989-1995</td>
</tr>
</tbody>
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RESEARCH INTERESTS

Computer-aided design and test of digital and mixed-signal RF IC, VLSI/FPGA/GPU for real-time signal processor, microwave and ultra wide-band receivers.

PROFESSIONAL SERVICE

Editorial Board

- Integration, the VLSI Journal
- VLSI Design Journal
- Journal of Computers
- International Journal of Advancements in Computing Technology
- VLSI Design: An International Journal

Service

- Associate Editor (2010-present)
- Editor (2009-present)
- Editor (2009-present)
- Associate Editor-in-Chief (2009-present)
- Guest Editor (2002)

Professional Committee

- 2015 IEEE International Instrumentation and Measurement Technology Conf. (I^3MTC’15)
- 2015 IEEE the 2nd International Workshop on the Design and Performance of Networks on Chip
- 2014 IEEE International Instrumentation and Measurement Technology Conf. (I^3MTC’14)
- 2013 IEEE International Instrumentation and Measurement Technology Conf. (I^3MTC’13)

Service

- Technical Committee
- Technical Committee
- Technical Committee
- Technical Committee
2013 IEEE International Conference on Smart Instrumentation, Measurement and Applications (ICSIMA'13)
2012 IEEE International Instrumentation and Measurement Technology Conf. (I*MTC’12)
2011 IEEE International Instrumentation and Measurement Technology Conf. (I*MTC’11)
2010 IEEE International Symposium on Circuits and Systems (ISCAS’10)
2010 IEEE Asia Pacific Conference on Circuits and Systems (APCCAS’10)
2009 IEEE International Symposium on Circuits and Systems (ISCAS’09)
2008 IEEE International Midwest Symposium on Circuits and Systems
2008 IEEE International Instrumentation and Measurement Technology Conf. (I*MTC’08)
2008 IEEE International Symposium on Circuits and Systems (ISCAS’08)
2007 IEEE International Symposium on Circuits and Systems (ISCAS’07)
2007 IEEE International Midwest Symposium on Circuits and Systems
2006 IEEE Instrumentation and Measurement Technology Conf. (IMTC’06)
2006 IEEE International Symposium on Circuits and Systems (ISCAS’06)
2005 IEEE Instrumentation and Measurement Technology Conf. (IMTC’05)
2004 IEEE Instrumentation and Measurement Technology Conf. (IMTC’04)
2003 Annual Conference of the IEEE Industrial Electronics (IECON’03)
2002 IEEE International ASIC/SOC Conference (SOCC’02)
2001 IEEE International ASIC/SOC Conference (SOCC’01)
2000 IEEE International ASIC/SOC Conference (SOCC’00)
1996 IEEE International ASIC Conference and Exhibit (ASIC’96)
1995 Ohio Symposium on Information Science and Technology
1995 IEEE International ASIC Conference and Exhibit (ASIC’95)

Journal and Conference
1995 the 6th VLSI Design/CAD Symposium
IEEE Transactions on Computer-Aided Design
IEEE Transactions on Computers
IEEE Transactions on Reliability
IEEE Transactions on Aerospace & Electronic Systems
IEEE Transactions on Circuits and Systems (I), (II)
IEEE Transactions on Instrumentation and Measurement
IEEE Transactions on VLSI
IEEE Transactions on Semiconductor Manufacturing
IEEE Transactions on Aerospace and Electronic Systems
IEEE Signal Processing Letters
ACM Transactions on Embedded Computing Systems
International Journal of Computer Aided VLSI Design
VLSI Design Journal
Journal of Computers
International Journal of Advancements in Computing Technology
VLSI Design: An International Journal
Journal of Electronic Testing
ACM Transactions on Embedded Computing Systems
Journal of VLSI Signal Processing Systems
ACM/IEEE Design Automation Conference (DAC)
IEEE International Conference on Computer-Aided Design (ICCAD)
IEEE International Symposium on Circuits and Systems (ISCAS)
IEEE International Midwest Symposium on Circuits and System (IMSCAS)
IEEE Instrumentation and Measurement Technology Conf. (IMTC)
IEEE International ASIC/SOC Conference

Service
Plenary Speaker
Technical Reviewer
SCHOLARSHIP

Book and Chapters

Peer-Reviewed Journal Articles and Papers Published in Full in Conference Proceedings

2015

2013-2014

2011-2012


2009-2010


2007-2008


2005-2006


2003-2004


2001-2002

1999-2000

1997-1998


**1995-1996**


**1993-1994**


**1989-1992**


RESEARCH GRANTS AND CONTRACTS

Non-Uniform Compressive Sensing Technique Development for EW Receiver Application
DAGSI/Air Force Research Lab (2\textsuperscript{nd} year)
Principal Investigator, $70,521 (05/07/14 – 05/06/15)

Ultra High Chirp Rate Digital Chirp Receiver Using Monobit IFM Digital Receiver as a Core
DAGSI/Air Force Research Lab (3\textsuperscript{rd} year)
Principal Investigator, $69,911 (06/13/13 – 06/12/14)

Non-Uniform Compressive Sensing Technique Development for EW Receiver Application
DAGSI/Air Force Research Lab (1\textsuperscript{st} year)
Principal Investigator, $69,360 (05/06/13 – 05/05/14)

Ultra High Chirp Rate Digital Chirp Receiver Using Monobit IFM Digital Receiver as a Core
DAGSI/Air Force Research Lab (2\textsuperscript{nd} year)
Principal Investigator, $67,272 (06/13/12 – 06/12/13)

High Efficiency SIGINT Collection
EDAptive Computing, Inc
Principal Investigator, $20,000 + cost sharing $11,511 (11/07/2012 – 12/14/2013)

Ultra High Chirp Rate Digital Chirp Receiver Using Monobit Instantaneous Frequency Measurement Digital Receiver as a Core
DAGSI/Air Force Research Lab (1\textsuperscript{st} year)
Principal Investigator, $66,571 (06/13/11 – 06/12/12)

New Electronic Warfare Specialists Through Advanced Research by Students (NEWSTARS)
DoD, Air Force Research Lab, NEWSTARs Plus-Up
My expenditure for 2010: $ 32,800

New Electronic Warfare Specialists Through Advanced Research by Students (NEWSTARS)
DoD, Air Force Research Lab, NEWSTARs Plus-Up
My expenditure for 2009: $13,000

FPGA-Based High Instantaneous Two-Signal Dynamic Range Digital Wide-Band Microwave Receiver
DoD, AFRL and MacAulay-Brown, Inc. (MacB)
Principal Investigator, $76,800 (04/10/07 – 07/31/08)

New Electronic Warfare Specialists Through Advanced Research by Students (NEWSTARS)
DoD, Air Force Research Lab, NEWSTARs Plus-Up
My expenditure for 2008: $10,000

RoCSTARS: Receiver-on-Chip Signal Techniques and Reconfigurable Simulations
Systran Federal Corp.
Principal Investigator, $1,140 (06/01/06 – 03/31/07)

New Electronic Warfare Specialists Through Advanced Research by Students (NEWSTARS)
DoD, Air Force Research Lab, NEWSTARs Plus-Up
My expenditure for 2007: $50,517

Receiver and Processing Concepts Evaluation
DoD, Air Force Research Lab
My expenditure: $67,980 (01/01/05 – 12/31/05)

New Electronic Warfare Specialists Through Advanced Research by Students (NEWSTARS)
DoD, Air Force Research Lab, NEWSTARs Plus-Up
My expenditure for 2006: $59,160
Performance Improvement of a Receiver on a Chip
Systran Federal Corp.
Principal Investigator, $15,000 (04/11/05 – 01/10/06)

Mathematic Model and Solution Approaches to the Systematic Design of Linear Feedback Shift Register (LFSR) BIST
The State of Ohio
Co-Principal Investigator, $10,000 (06/01/05 – 06/01/06) (Co-PI: X. Zhang)

Receiver and Processing Concepts Evaluation
DoD, Air Force Research Lab,
My expenditure: $53,650 (06/01/04 – 12/31/04)

Electronic Warfare (EW) Receiver-On-a-Chip (ROC)
DoD, Air Force Research Lab
Principal Investigator, $300,000 (06/01/03 – 06/01/05) (Co-PI: Marty Emmert)

Timing Verification for High Speed CMOS Design Styles
Baynacre, Inc.
Principal Investigator, $5,415 (05/99 – 08/99)

Complexity Management and Test/Diagnosis for Deep Submicron Integrated Circuit Design
State of Ohio
Principal Investigator, $10,800 (01/99 – 12/99)

Automatic Vector Generation and False Path Verification in Static/Dynamic Timing Analysis
Baynacre, Inc. and ITRI
Principal Investigator, $64,862 (08/01/98 - 07/31/99)

Optimal Physical Design, Design for Testability and Design Verification of a Monobit Receiver
DoD, Air Force Research Lab
Principal Investigator, $25,350 (03/01/98 – 08/30/98)

A Coupling of Timing Analysis and Simulation for Deep Submicron Integrated Circuit (IC) Technology
Baynacre, Inc.
Principal Investigator, $26,888 (12/01/97 – 03/31/98)

FFT Based VLSI Design Monobit Electronic Warfare Receiver
Air Force Office of Scientific Research (AFOSR)
Principal Investigator, $100,000 (08/01/96 – 03/31/98)

Testable Circuit Design of an Enhancement Memory Chip (EMC)
Wright Laboratories of U.S. Air Force
Principal Investigator, $20,000 (06/01/96 – 12/31/96)

VLSI Testability Synthesis on Graphics PiXEL VLSI Microcircuit
Wright Laboratories of US Air Force
Principal Investigator, $25,000 (09/01/95 - 05/15/96)

VLSI Testability Synthesis Tool (VTST)
Wright Laboratories of US Air Force
Principal Investigator, $547,148.00 (04/15/93 - 05/15/96)
($135,000 (04/93 - 09/94); $250,000 (09/94 – 08/95); $162,148 (09/95 – 05/96))

Internal Testability and Fault Coverage for MIPS R3x00
Texas Instruments
Principal Investigator, $35,000 (11/93 - 03/94)

Using VHDL in VLSI BIST Synthesis and Its Application to 3-D PiXEL Graphics Chip
Air Force Office of Scientific Research (AFOSR)
Principal Investigator, $20,000 (01/93 - 12/93)
A Study on Incorporating Built-In Self-Test (BIST) features into the MIPSCo R3000-derived microcircuits
LSI Logic Corporation
Principal Investigator, $30,000 (06/92 - 09/92)

Modular Design Environment (MDE) Software System
LSI Logic Corporation
Principal Investigator, $17,500 (06/92 - 05/93)

Advanced BIST Design on SF1 RISC Processor
State of Ohio
Principal Investigator, $31,000 (01/90 - 12/91)

AWARDS and HONORS

<table>
<thead>
<tr>
<th>Title of Award</th>
<th>Granting Association</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominee for Excellence in Teaching</td>
<td>College of Engineering and Computer Science, WSU</td>
<td>2014</td>
</tr>
<tr>
<td>Nominee for Excellence in Teaching</td>
<td>College of Engineering and Computer Science, WSU</td>
<td>2007</td>
</tr>
<tr>
<td>Nominee for Excellence in Teaching</td>
<td>College of Engineering and Computer Science, WSU</td>
<td>2005</td>
</tr>
<tr>
<td>Research Excellence Award</td>
<td>College of Engineering and Computer Science, WSU</td>
<td>1995</td>
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</table>

ACADEMIC SERVICE

<table>
<thead>
<tr>
<th>University Committees</th>
<th>Position</th>
<th>Dates</th>
</tr>
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<tbody>
<tr>
<td>Scholarship Committee</td>
<td>Member</td>
<td>2012</td>
</tr>
<tr>
<td>College Committees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering College Faculty Development Committee</td>
<td>Member</td>
<td>2014-2015</td>
</tr>
<tr>
<td>EE Department Chair Search Committee</td>
<td>Member</td>
<td>2013-2014</td>
</tr>
<tr>
<td>Scholarship Committee</td>
<td>Member</td>
<td>2013-2014</td>
</tr>
<tr>
<td>Scholarship Committee</td>
<td>Chair</td>
<td>2011-2012</td>
</tr>
<tr>
<td>Scholarship Committee</td>
<td>Member</td>
<td>2010-2011</td>
</tr>
<tr>
<td>Student Affair Committee</td>
<td>Chair</td>
<td>2009-2010</td>
</tr>
<tr>
<td>Student Affair Committee</td>
<td>Member</td>
<td>2008-2009</td>
</tr>
<tr>
<td>Academic Computing Committee</td>
<td></td>
<td>2008-2009</td>
</tr>
<tr>
<td>Engineering College Ph.D. Program Affair Committee</td>
<td>Chair of Electronics, Microwave, VLSI, and Nanotechnology</td>
<td>2008-2010</td>
</tr>
<tr>
<td>Engineering College Ph.D. Program Affair Committee</td>
<td>Chair of Electronics, Microwave, VLSI, and Nanotechnology</td>
<td>2007-2008</td>
</tr>
<tr>
<td>EE Department Chair Search Committee</td>
<td></td>
<td>2007-2008</td>
</tr>
<tr>
<td>Engineering College Student Affair Committee</td>
<td>Chair of Microwave and Electronics</td>
<td>2006-2007</td>
</tr>
<tr>
<td>EE Department Chair 5-year Review Committee</td>
<td>Member</td>
<td>2006-2007</td>
</tr>
<tr>
<td>Graduate Council Standing Committee</td>
<td>Member</td>
<td>2005-2006</td>
</tr>
<tr>
<td>Engineering College Student Affair Committee</td>
<td>Chair of Microwave and Electronics</td>
<td>2005-2006</td>
</tr>
<tr>
<td>Engineering College Student Affair Committee</td>
<td>Chair of Microwave and Electronics</td>
<td>2004-2005</td>
</tr>
</tbody>
</table>
COURSES TAUGHT   Graduate (G) and Undergraduate (U)

EE7520 - Low Power VLSI System Design (G)
EE7530- VLSI Design Synthesis and Optimization (G)
EE7540- VLSI Testing and Design for Testability (G)
EE7580 - CMOS Analog Circuit Design (G)
EE4540- VLSI Design (G&U)
EE459- Integrated Circuit Design Synthesis with VHDL (G&U)
EE4440- Electronic Integrated Systems (U)
EE3310- Electronic Devices and Circuits (U)
EE2000- Digital Design with VHDL (U)
**Ph.D. DISSERTATION SUPERVISED**

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethan Lin</td>
<td>Digital Wideband Receiver based on Subsampling Data Compressive Sensing, in progress (date passed Dissertation proposal: Fall 2014).</td>
</tr>
<tr>
<td>Kumar Yelamarthi</td>
<td>Process Variation Aware Timing Optimization with Load Balance of Multiple Paths in Dynamic and Mixed-Static-Dynamic CMOS Logic, June 2008 (initial employer: Assistant Professor of Electrical Engineering, Central Michigan University, Mount Pleasant, MI).</td>
</tr>
<tr>
<td>Mingzhen Wang</td>
<td>High-Speed Low-Power Pipelined Flash A/D Converter for System-on-a-Chip Applications, Dec. 2007 (initial employer: Assistant Professor of Electronic Engineering Department at University of Electronic Science and Technology of China, Chengdu, China).</td>
</tr>
<tr>
<td>Kiran George</td>
<td>Design and Performance Evaluation of 1 Giga Hertz Wideband Digital Receiver, Sept. 2007 (initial employer: Assistant Professor of Computer Engineering, California State University, Fullerton, CA).</td>
</tr>
</tbody>
</table>

**M.S. THESES SUPERVISED**

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feiran Liu</td>
<td>UWB Receiver Architecture for High Instantaneous Two-Tone Signal Detection (in progress).</td>
</tr>
<tr>
<td>Surya Kiran Akkaladevi</td>
<td>Simulation Model for Magnetic Tunnel Junction Transistor for Logic (in progress).</td>
</tr>
<tr>
<td>Julin Sha</td>
<td>Compressive Sensing Front-End RF Applications (in progress)</td>
</tr>
<tr>
<td>Xin Hu</td>
<td>Autocorrelation Error Analysis of Digital Instantaneous Frequency Measurement Receivers (in progress)</td>
</tr>
<tr>
<td>Lihzong He</td>
<td>Fixed-Point Optimization Dynamic Kernel FFT Processor (in progress)</td>
</tr>
<tr>
<td>Kaushik Katpally</td>
<td>Dynamic Repeater with Booster Enhancement for Fast Switching Speed and Propagation in Long Interconnect, fall 2014 (Ph.D at Wright State University).</td>
</tr>
<tr>
<td>Hao Xue</td>
<td>Timing and Power Optimization for Mixed-Dynamic-Static CMOS, summer 2013 (Ph.D at Wright State University).</td>
</tr>
<tr>
<td>Ramadan Buzukuk</td>
<td>Dynamic Footed with Clock Overlapping and Load Balancing in Multiple Paths for Noise Tolerance in Dynamic CMOS Circuits, fall 2011 (initial employer: Qualcomm, San Diego, CA).</td>
</tr>
<tr>
<td>Stephen Benson</td>
<td>Adaptive Thresholding for Detection of Radar Receiver Signals, summer 2010 (continuing Ph.D at Wright State University).</td>
</tr>
<tr>
<td>Ryan Bone</td>
<td>FPGA-Based Low-Power 256-point FFT Processor, estimated summer 2008 (initial employer: Science Applications International Corporation (SAIC), Beavercreek, OH).</td>
</tr>
</tbody>
</table>
Vivek Sarathy

Rajasekhar Keerthi

James Helton
FPGA-Based Processor for Digital Instantaneous Frequency Measurement (IFM) Receiver, summer 2007 (initial employer: Science Applications International Corporation (SAIC), Beavercreek, OH).

Brian Poling

Tony Chiang

Cyprian Sajabi

Siaw-Yuen Ng

Sashank Kakulavarapu

Vivek Chandrasekhar

Jason Wibbenmeyer
Built-In Self-Test for Low-Voltage High-Speed Analog-to-Digital Converters, winter 2005 (initial employer: Ameren, St. Louis, MO).

Soumya Ramaswamy
High Speed 64-bit Thermometric Square-Root Carry Select Adder Based on the Chinese Abacus, winter 2005.

Rathod Snehal
Architecture of Hybrid Signed-Digit Adder using carry-free property of redundant arithmetic and parallel redundant-to-binary converter, winter 2005.

Shailes Radhakrishnan
A Low-Power 4-b 2.5 Gsample/s Flash Analog-to-Digital Converter Using QV Comparator and DCVSPG Encoder, fall 2004 (initial employer: Link Electronics, Cape Girardeau, Missouri).

Darren Schindel
Arc Draw Algorithm Utilizing Bresenham Circle Algorithm and Multiple Clipping Techniques For Graphics Generation Using an Active Matrix Liquid Crystal Display, fall 2004 (initial employer: Unisys, Plymouth, MI.).

Kumar Yelamarthi
Design Synthesis of Re-Convergent Manchester Carry Chain Adders, fall 2004 (continue for Ph.D. at WSU)

Nilesh Gunjal
Design Synthesis of High-Speed Testable Hybrid Adders, fall 2004 (initial employer: Cingular Wireless, Dallas, TX.)

Pavan Lingamaneni
Low-Power Low-Leakage Asymmetric SRAM using Dual Threshold Voltages, summer 2004.

Mahesh Subramanian
Pipeline with Scan Insertion for Timing Driven Testable Convergent Tree Adders, summer 1999 (initial employer: Intel Corporation, San Jose, CA).

N. Thiagarajan
VHDL Modeling, Simulation and Synthesis of Fully-Testable Fast Binary Carry-Save Multiplier without Final Addition, summer 1998 (initial employer: NEC America, Austin, TX).

Mahesh Wagh

Khalil Habash
VHDL Modeling, Simulation and Testing of a Fast Binary Adder with Conditional Carry Generator, summer 1997 (initial employer: Cray Research Corporation, Wisconsin).

Joaquin Romera
Timing-Driven Testable VLSI Parallel Adders, summer 1997 (initial employer: Intel Corporation, Portland, OR).

Rajesh Palamadai

Sin Kwang Pok
High Level Test Generation and Test Verification for the Enhanced Memory Chip (EMC), summer 1996 (initial employer: Baynacre, Union City, CA).
Anil Kempanna  Cellular Automata Based Test Generator, winter 1995 (initial employer: Cadence Spectrum Design, San Diego, CA).

Anup Kumar  Area-Time Optimal Digital Mixed CMOS/BiCMOS Parallel Adders, winter 1995 (initial employer: Credence Systems Corporation, Fremont, CA).


Vijay K. Singh  Circular Built-In Self-Test in VLSI Circuits, fall 1993 (initial employer: Advanced Micro Devices, Austin, TX).


Jan. 2015
Curriculum Vitae of
Dr. John M. Emmert

EDUCATION
5. Air Command and Staff College, United States Air Force Air University, 2005.

ACADEMIC PROFESSIONAL EXPERIENCE
1. Wright State University, OH: Tenured Professor of Electrical Engineering (August ’13 to present)
2. Wright State University, OH: Tenured Associate Professor of Electrical Engineering (July ’05 to July ’13)
3. University of North Carolina at Charlotte, NC: Tenured Associate Professor of Electrical and Computer Engineering and Director of Computer Engineering (August ’04 to June ’05)
4. Wright State University, OH: Assistant Professor of Electrical Engineering (January ’02 to August ’04)
5. University of North Carolina at Charlotte, NC: Assistant Professor of Electrical and Computer Engineering (July ’00 to December ’01)
6. University of Kentucky, KY: Assistant Professor of Electrical Engineering (July ’99 to June ’00)
7. University of Cincinnati, OH: Research Assistant (September ’96 to June ’99), Teaching Assistant (January ’98 to April ’98)

OTHER PROFESSIONAL EXPERIENCE
1. Air Force Research Laboratory, Aerospace Systems Directorate, United States Air Force Reserves, Edwards AFB, CA: IMA to the AFRL Detachment 7 Commander (August ’12 to present)
2. RBS Technologies Inc.: Consultant (March ’08 to present)
3. Air Force Space Command, 689th Combat Communications Wing, United States Air Force Reserves: IMA to the Commander (November ’11 to August ’12)
4. Air Force Research Laboratory, Sensors Directorate, United States Air Force Reserves, Wright Patterson AFB, OH: On-site Senior IMA, Director of Digital Design Sensors Directorate, and Division Lead Reservist (January ’05 to October ’11)
   a. Level III APDP certified, SPRDE
   b. Level III APDP certified, Scientist
   c. Level II APDP certified, Test and Evaluation
5. Air Force Research Laboratory, Information Directorate, United States Air Force Reserves, Wright Patterson AFB, OH: Chief Technologist for External Programs (January ’03 to December ’05)
6. Air Force Research Laboratory, Avionics Directorate, United States Air Force Reserves, Wright Patterson AFB, OH: Research Scientists for United States Air Force Reserves (December ’96 to December ’02)


8. Wright Laboratory, Electronics Directorate, United States Air Force, Wright Patterson AFB, OH: Electronic Circuits and Systems Research Engineer (December ’93 to December ’96)


10. Officer Training School, United States Air Force, Lackland AFB, TX: Officer Trainee (June’89 to September ’89)

11. Stokley’s Marine, Nicholasville, KY: Mechanic (January’81 to June ’89)

PROFESSIONAL MEMBERSHIPS
1. Senior Member of Institute of Electrical and Electronics Engineers (IEEE) since 2004
2. Member of United States Air Force Reserve (USAFR) since 1996
4. Member of Institute of Electrical and Electronics Engineers (IEEE) since 1992
5. Member of Electrical Engineering Honor Society Eta Kappa Knu (HKN) since 1985

AWARDS AND MAJOR ACCOMPLISHMENTS
1. IEEE Harold Nobel Award, (’14)
2. Excellence in Teaching Award for Faculty (finalist), College of Engineering and Computer Science, Wright State University, (’13)
3. Promoted to Col, United States Air Force Reserve, (’11)
4. Excellence in Teaching Award for Faculty (finalist), College of Engineering and Computer Science, Wright State University, (’09)
5. James B. Tsui Award for best patent, Air Force Research Laboratory Sensors Directorate, (’08)
6. Officer Reservist of the Year, Air Force Research Laboratory, (’07)
7. Excellence in Teaching Award for Faculty (finalist), College of Engineering and Computer Science, Wright State University, (’06)
8. Presidential Award for Faculty Excellence in Early Career Achievement, Wright State University, (’04)
9. Selected to become a Senior Member of the IEEE, (’04)
10. Excellence in Teaching Award for Faculty (finalist), College of Engineering and Computer Science, Wright State University, (’03)

TEACHING (DISSERTATION/THESIS/ADVISING)
PhD Dissertations
1. Vipul Patel, Expected, (’15)

**Masters Theses**


9. John Flynn, *GPS Coarse Acquisition using the MonoBIT FFT Algorithm in a Broadband Receiver*, MSEE, (‘08)


11. Peter E. Buxa, *Parameterizable Channelized Wideband Digital Receiver for High Update Rate*, MSEE, (‘07)


16. Sandeep Umarani, *FPGA Implementation of a Digital PID Controller*, MSEE, (‘04) (co-advises with Dr. K. Rattan)

17. Sudhir Patli, *Hardware Implementation of a Radix-4 Fast Fourier Transform Technique with Improved Two-Tone Resolution for Electronic Warfare Applications*, MSEE, (‘04)

18. David Kennedy Gaya, *A Rectilinear Placement Algorithm for Field Programmable Gate Arrays*, MSEE, (‘04)


TEACHING (COURSES)

Wright State University
EE 7550 – Trust for Integrated Circuit Design – 48 students (spring ’15)
EE 7530 – VLSI Design Synthesis and Optimization – 29 students (fall ’14)
EE 7530 – VLSI Design Synthesis and Optimization Lab – 29 students (fall ’14)
EE 4620/6620 – Circuit Design with CPLDs and FPGAs – 36 students (fall ’14)
EE 4620/6620 – Circuit Design with CPLDs and FPGAs Lab – 36 students (fall ’14)
EE 4620/6620 – Circuit Design with CPLDs and FPGAs – 114 students (summer ’14)
EE 4620/6620 – Circuit Design with CPLDs and FPGAs Lab – 114 students (summer ’14)
EE 7530 – VLSI Design Synthesis and Optimization – 29 students (summer ’14)
EE 7530 – VLSI Design Synthesis and Optimization Lab – 29 students (summer ’14)
EE 4620/6620 – Circuit Design with CPLDs and FPGAs – 130 students (spring ’14)
EE 4620/6620 – Circuit Design with CPLDs and FPGAs Lab – 130 students (spring ’14)
EE 2000 – Digital Design with HDLs – 56 students (spring ’14)
EE 2000 – Digital Design with HDLs Lab – 56 students (spring ’14)
EE 8000 – VLSI Cohort Remedial Instruction – 82 students (spring ’14)
EE 8000 – VLSI Cohort Remedial Instruction Lab – 82 students (spring ’14)
EE 7530 – VLSI Design Synthesis and Optimization – 57 students (fall ’13)
EE 7530 – VLSI Design Synthesis and Optimization Lab – 57 students (fall ’13)
EE 4620/6620 – Circuit Design with CPLDs and FPGAs – 37 students (summer ’13)
EE 4620/6620 – Circuit Design with CPLDs and FPGAs Lab – 37 students (summer ’13)
EE 2000 – Digital Design with HDLs – 54 students (spring ’13)
EE 2000 – Digital Design with HDLs Lab – 54 students (spring ’13)
EE 4620/6620 – Circuit Design with CPLDs and FPGAs – 57 students (spring ’13)
EE 4620/6620 – Circuit Design with CPLDs and FPGAs Lab – 57 students (spring ’13)
EE 2000 – Digital Design with HDLs – 46 students (fall ’12)
EE 2000 – Digital Design with HDLs Lab – 46 students (fall ’12)
EE 7530 – VLSI Design Synthesis and Optimization – 12 students (fall ’12)
EE 7530 – VLSI Design Synthesis and Optimization Lab – 12 students (fall ’12)
EE 160 – Digital Design with HDLs – 27 students (spring ’12)
EE 462/662 – Circuit Design with CPLDs and FPGAs – 15 students (spring ’12)
EE 462/662 – Circuit Design with CPLDs and FPGAs Lab – 15 students (spring ’12)
EE 753 – VLSI Design Synthesis and Optimization – 23 students (winter ’12)
EE 753 – VLSI Design Synthesis and Optimization Lab – 23 students (winter ’12)
EE 301/501 – Circuit Analysis I – 36 students (winter ’12)
EE 302/502 – Circuit Analysis I Lab – 78 students (winter ’12)
EE 301/501 – Circuit Analysis I – 31 students (fall ’11)
EE 301/501 – Circuit Analysis I Lab – 35 students (fall ’11)
EE 302/502 – Circuit Analysis I Lab – 70 students (fall ’11)
Sabbatical break (fall ’10 – spring ’11)

1 developed all new course material – part of Dept of CSE Cyber Security Program
EE 160 – Digital Design with HDLs – 27 students (spring ’10)
EE 462/662 – Circuit Design with CPLDs and FPGAs – 21 students (spring ’10)
EE 462/662 – Circuit Design with CPLDs and FPGAs Lab – 21 students (spring ’10)
EE 160 – Digital Design with HDLs – 24 students (winter ’10)
EE 753 – VLSI Design Synthesis and Optimization – 34 students (winter ’10)
EE 753 – VLSI Design Synthesis and Optimization Lab – 34 students (winter ’10)
EE 754 – VLSI Testing and Design for Testability – 5 students (fall ’09)
EE 754 – VLSI Testing and Design for Testability Lab – 5 students (fall ’09)
EE 454/654 – VLSI Design – 26 students (fall ’09)
EE 454/654 – VLSI Design Lab – 26 students (fall ’09)
EE 462/662 – Circuit Design with CPLDs and FPGAs – 16 students (winter ’09)
EE 462/662 – Circuit Design with CPLDs and FPGAs Lab – 16 students (winter ’09)
EE 454/654 – VLSI Design – 41 students (fall ’08)
EE 454/654 – VLSI Design Lab – 41 students (fall ’08)
EE 753 – VLSI Design Synthesis and Optimization – 18 students (spring ’08)
EE 753 – VLSI Design Synthesis and Optimization Lab – 18 students (spring ’08)
EE 462/662 – Circuit Design with CPLDs and FPGAs – 21 students (winter ’08)
EE 462/662 – Circuit Design with CPLDs and FPGAs Lab – 21 students (winter ’08)
EE 301/501 – Circuit Analysis I – 21 students (fall ’07)
EE 454/654 – VLSI Design – 19 students (fall ’07)
EE 454/654 – VLSI Design Lab – 19 students (fall ’07)
EE 462/662 – Circuit Design with CPLDs and FPGAs – 21 students (spring ’07)
EE 462/662 – Circuit Design with CPLDs and FPGAs Lab – 21 students (spring ’07)
EE 454/654 – VLSI Design – 23 students (winter ’07)
EE 454/654 – VLSI Design Lab – 23 students (winter ’07)
EE 462/662 – Circuit Design with CPLDs and FPGAs – 22 students (winter ’07)
EE 462/662 – Circuit Design with CPLDs and FPGAs Lab – 22 students (winter ’07)
EE 454/654 – VLSI Design – 50 students (fall ’06) 3
EE 454/654 – VLSI Design Lab – 50 students (fall ’06) 4
EE 462/662 – Circuit Design with CPLDs and FPGAs – 9 students (spring ’06)
EE 462/662 – Circuit Design with CPLDs and FPGAs Lab – 9 students (spring ’06)
EE 753 – VLSI Design Synthesis and Optimization – 36 students (spring ’06)
EE 753 – VLSI Design Synthesis and Optimization Lab – 36 students (spring ’06)
EE 454/654 – VLSI Design – 26 students (winter ’06)
EE 454/654 – VLSI Design Lab – 26 students (winter ’06)
EE 462/662 – Circuit Design with CPLDs and FPGAs – 23 students (winter ’06)
EE 462/662 – Circuit Design with CPLDs and FPGAs Lab – 23 students (winter ’06)
EE 454/654 – VLSI Design – 46 students (fall ’05)
EE 454/654 – VLSI Design Lab – 46 students (fall ’05)
EE 301/501 – Circuit Analysis I – 32 students (fall ’05)
EE 458/658 – Circuit Design with CPLDs and FPGAs – 22 students (summer ’04)
EE 458/658 – Circuit Design with CPLDs and FPGAs Lab – 22 students (summer ’04)
EE 753 – VLSI Design Synthesis and Optimization – 40 students (spring ’04)
EE 753 – VLSI Design Synthesis and Optimization Lab – 40 students (spring ’04)
EE 458/658 – Circuit Design with CPLDs and FPGAs – 51 students (winter ’04)
EE 458/658 – Circuit Design with CPLDs and FPGAs Lab – 51 students (winter ’04)
EE 454/654 – VLSI Design – 51 students (fall ’03) 5
EE 454/654 – VLSI Design Lab – 51 students (fall ’03) 6

2 developed all new labs
3 developed all new course material – based on development, characterization, and use of standard cells (130 nm cell technology)
4 developed all new labs – updated all labs to use industry standard Cadence IC design flow
5 developed all new course material – based on development, characterization, and use of standard cells (250 nm cell technology)
Curriculum Vita
John M. Emmert
Page 6 of 12

EE 753 – VLSI Design Synthesis and Optimization – 69 students (spring ’03)
EE 753 – VLSI Design Synthesis and Optimization Lab – 69 students (spring ’03)
EE 301/501 – Circuit Analysis I – 49 students (winter ’03)
EE 458/658 – Circuit Design with CPLDs and FPGAs – 46 students (winter ’03)
EE 458/658 – Circuit Design with CPLDs and FPGAs Lab – 46 students (winter ’03)
EE 454/644 – VLSI Design – 42 students (fall ’02)
EE 454/644 – VLSI Design Lab – 42 students (fall ’02)
EE 753 – VLSI Design Synthesis and Optimization – 49 students (spring ’02)
EE 753 – VLSI Design Synthesis and Optimization Lab – 49 students (spring ’02)
EE 301/501 – Circuit Analysis I – two sections (winter ’02)

University of North Carolina at Charlotte
ECGR 3181 – Digital Logic Design II (spring ’05)
ECGR 4182/5182 – Digital Systems Test (spring ’05)
ECGR 3182 – Digital Logic Devices (fall ’04)
ECGR 4433/5133 – VLSI Systems Design (fall ’04)
ECGR 2181 – Digital Logic Design (fall ’01)
ECGR 6138/8138 – Physical Design Automation for VLSI Circuits and Systems (fall ’01)
ECGR 6146 – Advanced VHDL (spring ’01)
ECGR 6138/8138 – Physical Design Automation for VLSI Circuits and Systems (fall ’00)

University of Kentucky
EE 581 – Advanced Digital Logic Design (fall ’99)
EE 599 – Physical Design Automation for VLSI Circuits and Systems (spring ’00)
EE 599 – Physical Design Automation for VLSI Circuits and Systems (spring ’00)

SCHOLARSHIP

PUBLICATIONS


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6 developed all new labs – from day one, students layout, extract, and simulate physical circuits
7 developed all new generic course material (independent of commercial FPGA architectures)
8 developed all new labs for Xilinx Virtex2 FPGAs – lab development includes 20 FPGA stations
9 Introduced class


    FPGAs,” *ACM Transactions on Design Automation of Computer Systems*, Volume 11, Number 2, pp. 
    501-533, April 2006.

    Implementation of a Fuzzy Logic Controller on Programmable Hardware,” 2005 *IEEE North 
    American Fuzzy Information Processing Society Soft Computing for Real World Applications 


    Logic Blocks,” *IEEE Transactions on VLSI Systems*, Volume 12, Number 12, pp. 1284-1294, 
    December 2004.

14. J. M. Emmert and J. A. Cheatham, “A Monolithic Spectral BIST Technique for Control or Test of 
    Analog or Mixed-Signal Circuits,” 2003 *IEEE International Symposium on Defect and Fault 

    On-Chip Generation and Analysis of Sinusoidal Signals,” 2003 *IEEE International Symposium on 


    for FPGA Interconnect with Roving STARs,” Proceedings of the 2001 *IEEE International Symposium 

    FPGAs Minus the Router,” Proceedings of the 2001 *IEEE International Symposium on Defect and 

    Testing, Diagnosis, and Fault Tolerance for FPGAs in Adaptive Computing Systems,” Proceedings of 

    FPGA Interconnect Using Roving STARs,” Proceedings of the *IEEE International Online Test 

23. C. E. Stroud, J. M. Emmert, A. Taylor, and J. T. Ferry, “Recovering Faulty Processing Elements in 
    VLSI Processor Arrays,” *Autotestcon*, September 2001. (received Best Paper Award)


US PATENTS


BOOK CHAPTER SECTION


TECHNICAL REPORTS


PROGRAMATIC BRIEFINGS (Facilitated establishment of RAPCEval program at Wright State)

1. “NEWSTARs Electronic Warfare Program,” United States House of Representatives Staffers for Austria (Ohio) and Turner (Ohio), and United States Senate Staffers for Voinovich (Ohio) and Brown (Ohio), February 2009.
2. “NEWSTARs Electronic Warfare Program,” United States House of Representatives Staffers for Hobson (Ohio) and Turner (Ohio), and United States Senate Staffers for Voinovich (Ohio) and Brown (Ohio), February 2008.
3. “NEWSTARs Electronic Warfare Program,” United States House of Representatives Staffers for Hobson (Ohio) and Turner (Ohio), and United States Senate Staffers for Voinovich (Ohio) and Brown (Ohio), January 2007.


7. “Electronic Warfare Receiver On-a-Chip (EWROC),” United States House of Representatives Staffers for Hobson (Ohio), Turner (Ohio), Kingston (Georgia), and United States Senate Staffers for Chambliss (Georgia), (2 February 2004); and United States Senate Staffers for DeWine (Ohio), February 2004.

ABSTRACT, WORKSHOP, AND INVITED PRESENTATIONS


GRANTS FUNDED

RBS Technologies LLC

1. Siferd, Emmert, George and Ren, Phase I SBIR, Low Power Multi-Channel RF and Digital GPS Anti-Jam ASIC, United States Air Force, 2013-2014. (waiting to hear on Phase II proposal)


Wright State University


7. Emmert and Garber, New Electronic Warfare Specialists Through Advanced Research by Students (NEWSTARS), $250,000 (’06), $250,000 (’07), and $500,000 (’09), Congress (Start Date 1 July 2006).


University of North Carolina at Charlotte


University of Kentucky


**SERVICE**

**PROFESSIONAL**

1. Member of United States Air Force (USAF) 1989-1996

2. Member of United States Air Force Reserve (USAFR) since 1996 (on duty at an Air Force Base an average 5 weeks per year for the last 16 years)


4. Technical Committee: ACM/SIGDA International Symposium on Field Programmable Gate Arrays

5. Technical Committee: IEEE North Atlantic Test Workshop

6. Reviewer: IEEE Transactions on Very Large Scale Integration (VLSI) Systems

7. Reviewer: ACM Transactions on Embedded Systems

8. Reviewer: Journal of Very Large Scale Integrated Circuit Design

9. Reviewer: Journal of Electronic Testing


11. Reviewer: ACM/SIGDA International Symposium on Field Programmable Gate Arrays

12. Reviewer: IEEE International Symposium on Circuits and Systems

13. Reviewer: International Test Conference (ITC)
14. Reviewer: Collaborative Technologies Symposium
15. Program monitor for several DARPA funded programs
16. Program monitor for several USAF SBIR programs

UNIVERSITY

Wright State University
1. Member University Athletics Council
2. Member University Petitions Committee
3. Member University Graduate Council Committee
5. Member College Steering Committee
6. Member College Curriculum Committee
7. Member College Faculty Development Committee
8. Member College Petitions Committee
9. Member College Program Affairs Committee
10. Member College Student Activities Committee
11. Member College Dissertation Qualified Faculty Committee
12. College PhD Focus Area Chair for Electronics, Microwave, VLSI, and Nanotechnology
13. Chair EE Under Graduate Studies Committee
14. Member Curriculum Committee
15. Chair EE Laboratory Resources Committee
16. Chair EE Core Subcommittee
17. Member EE Department ad hoc ABET Committee
18. Member EE Department Head Search Committee
19. Member Electronics/VLSI Subcommittee
20. Member Electrical Engineering Bylaws Committee
21. Member Electrical Engineering Faculty Search Committee

University of North Carolina at Charlotte
22. Director of Computer Engineering Program
23. Chair Undergraduate Administrative Committee (College)
24. Chair Focus Area Improvement Team (Department)
25. Member Promotion and Tenure Committee (Department)
26. Member Faculty Search Committee (Department)
EDUCATION:

Ph.D. in Electrical Engineering, October 1983.
University of Illinois, Urbana, Illinois
Dissertation: “Performance of Digital Communications over Selective Fading Channels.”

M.S. in Electrical Engineering, May 1978.
University of Illinois, Urbana, Illinois

B.S. in Electrical Engineering (with Honors), May 1975.
Tri-State University, Angola, Indiana.

ACADEMIC EXPERIENCE:

Chair, Department of Electrical Engineering, Wright State University, 2000 – 2008.
Associate Professor, Department of Electrical Engineering, Wright State University, 1994 – Present.
Assistant Professor, Department of Electrical Engineering, Wright State University, 1990 – 1994.
Assistant Professor, Department of Electrical Engineering and ElectroScience Laboratory, The Ohio State University, 1983 – 1990.

PROFESSIONAL MEMBERSHIPS:

IEEE, ASEE, Eta Kappa Nu, Tau Beta Pi, Phi Kappa Phi.

ACADEMIC AWARDS:

College of Engineering and Computer Science Outstanding Teaching (Finalist), 2002
College of Engineering and Computer Science Outstanding Teaching, 1998

TEACHING AND ADVISING:

Courses Taught:

EE 140: Principles of Electrical Engineering (Originator)
EE 301 (2010): Circuit Analysis
EE 321 (3210): Linear Systems I
EE 421 (4210): Digital Communications
EE 701 (7010): Linear Systems
EE 740 (7400): Information Theory (Originator)
EE 745 (7350): Wireless Communication
EE 761 (7610): Random Processes
EE 762 (7620): Detection & Estimation
EE 890: Error Control Coding (Originator)
EGR 101 (1010): Introductory Mathematics for Engineering Applications
EGR 190: (co-developer) Fundamentals of Engineering – predecessor to EGR 1010
EGR 191: (lab component of EGR 190, co-developer) Fundamentals of Engineering

Dissertations Supervised or Co-Supervised to Completion:


Theses Supervised:


Scholarship and Funding:

Publications in Refereed Journals:


**Intellectual Property:**

“Frequency-Dependent Circuit RFID with 3-D Positioning,” (with B. Rigling). US #7,988,055. Application, 2005, Awarded 2011.08.02. This property has been licensed to Intellectual Ventures.

**Publications in Conference Proceedings:**


**EXTERNAL INSTITUTIONAL FUNDING:**

*WSU Expenditures $1,613,000 of $3,000,000 Total Allocations*


*Congressional Add: WBI-Advanced Sensor-Based Vigilance Technologies for Countering Irregular and Disruptive Threats (SAVig), (with B. Rigling) 2006, $1,000,000. Facilitated collaborative involvement of: Professors L. Hong, B. Rigling, A. Shaw.*


Research Expenditures: (Apart from Institutional Funding)

Direct Responsibility of approximately $8,775,000 of approximately $21,401,000.
At WSU: Direct Responsibility of approximately $3,245,000 of approximately $11,270,000.

United Energy Systems: “Molecular Signatures,” Co-Principal Investigator, May 2014 – , RSP#, $105,000

NSF-IUCRC Center for Surveillance Research: “Probabilistic Understand of SAR Signature Variation,” Principal Investigator, September 2013 – May 2014, RSP# 668382, $44,000

Henry Jackson Foundation/711HPW: “HAPSITE ER Volatile Signature Recognition,” Co-Principal Investigator, September, 2013 – September 2014, RSP# 669273, $484,651


Air Force Research Laboratory: “Automatic Target Recognition Center,” Co-Principal Investigator, 2007 – Present, RSP# Various, ~ $3,700,000


University of South Alabama: “Developing Effective Strategies and Performance Metrics for Automatic Target Recognition,” Co-Principal Investigator, October 2001 – December 2002,
RSP# 665015, $23,683.


*Ohio Research Challenge Grant:* “Recognition of Objects in Two-Dimensional Radar Data Arrays,” Principal Investigator, August 1990, RSP (Internal) $3,000.


The Ohio State University Seed-Grant Program Grant: “Analysis of the Probability of Error of Radar Target Classification Systems,” Principal Investigator, June 1985 – September 1986, $7,000.

Student Support:

Since Promotion: 36 Quarters, Overall: 140 Quarters.

SERVICE:

University Committees:

<table>
<thead>
<tr>
<th>Year</th>
<th>Role</th>
<th>Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-2015</td>
<td>Member</td>
<td>Faculty Senate</td>
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<tr>
<td>2013-2014</td>
<td>Member</td>
<td>Faculty Senate</td>
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<tr>
<td>2013-2014</td>
<td>Member at Large</td>
<td>AAUP-WSU Executive Committee</td>
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<tr>
<td>2013-2014</td>
<td>Member</td>
<td>Community Standards Panel</td>
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<tr>
<td>2012-2013</td>
<td>Member</td>
<td>Search Committee: Wright State University Provost</td>
</tr>
<tr>
<td>2012-2013</td>
<td>Member at Large</td>
<td>AAUP-WSU Executive Committee</td>
</tr>
<tr>
<td>2012-2013</td>
<td>Member</td>
<td>Faculty Senate</td>
</tr>
<tr>
<td>2012-2013</td>
<td>Member</td>
<td>Faculty Budget Priority Committee</td>
</tr>
</tbody>
</table>
2012-2013 Member HB7 Energy Performance Review Committee
2012-2013 Member Community Standards Panel
2011-2012 Vice President AAUP-WSU
2011-2012 Member Faculty Senate
2011-2012 Member Faculty Budget Priority Committee
2011-2012 Member Community Standards Panel
2010-2011 Member at Large AAUP-WSU Executive Committee
2010-2011 Member Ad Hoc Campus Master Plan Committee
2010-2011 Member Ad Hoc Student Conduct Committee
2010-2011 Member Commencement Committee
2010-2011 Member Community Standards Panel
2009-2010 Member Commencement Committee
2009-2010 Member Community Standards Panel
2008-2009 Member Judicial Review Panel
2008-2009 Member Commencement Committee
2007-2008 Member Judicial Review Panel
2006-2007 Member Judicial Review Panel
2006-2007 Member Search Committee: Chair, Department of Mathematics and Statistics
2004-2005 Member P & T Appeals Committee
2004-2005 Member Buildings and Grounds Committee
2004-2005 Member Search Committee: Dean, College of Engineering and Computer Science
2003-2004 Member Search Committee: Chair, Department of Mathematics and Statistics
2001-2002 Member Search Committee: Director, Kettering Center
2000-2001 Member CECS Representative to University Petitions Committee
1998-1999 Chair Student Affairs Committee
1998-1999 Member Academic Calendar Committee
1997-1998 Member Student Evaluation of Teaching Committee
1996-1997 Member Graduate Council
1996-1997 Member Student Affairs Committee
1996-1997 Member Commencement Committee
1996-1997 Member CECS Representative to University Petitions Committee
1995-1996 Member Search Committee, Director Research and Sponsored Programs
1995-1996 Member Graduate Council
1995-1996 Member Student Affairs Committee

College Committees:
2014-2015 Member College Ambassadors
2014-2015 Member Ad Hoc College Website Design Committee
2014-2015 Member Ad Hoc College Awards Committee
2013-2014 Member Search Committee: Chair, Department of Electrical Engineering
2013-2014 Member College Ambassadors
2013-2014 Committee of One College Bylaws Evaluation of Instruction
2013-2014 Member Ph.D. Student Affairs Committee
2013-2014 Member Ad Hoc College Awards Committee
2012-2013 Member Ph.D. Student Affairs Committee
2012-2013 Member Ad Hoc Distance Education Committee
2012-2013  Member  Staff Awards Committee  
2011-2012  Member  College Steering Committee  
2011-2012  Chair  Ph.D. SSIP Focus Area  
2011-2012  Member  Ph.D. Program Affairs Committee  
2011-2012  Member  College Steering Committee  
2011-2012  Member  College Curriculum Committee  
2011-2012  Member  Ad Hoc College Bylaws Committee  
2011-2012  Member  College Faculty Development Committee  
2011-2012  Chair  Ph.D. SSIP Focus Area  
2010-2011  Member  College Steering Committee  
2010-2011  Member  Ph.D. Program Affairs Committee  
2010-2011  Member  College Faculty Development Committee  
2010-2011  Member  College Curriculum Committee  
2007-2008  Chair  Search Committee: Chair, Department of Computer Science and Engineering  
2007-2008  Chair  Five-Year Chair Review Committee (BIE)  
2007-2008  Member  Ph.D. Student Affairs Committee  
2006-2007  Member  Ph.D. Student Affairs Committee  
2005-2006  Member  College Faculty Development Committee  
2005-2006  Member  Ph.D. Student Affairs Committee  
2004-2005  Member  College Faculty Development Committee  
2004-2005  Member  Ph.D. Student Affairs Committee  
2004-2005  Chair  Ph.D. Sensor, Signal and Image Processing Focus Area  
2003-2004  Chair  Ph.D. Sensor, Signal and Image Processing Focus Area  
2003-2004  Member  Ph.D. in Engineering Director Advisory Committee  
2001-2002  Member  Math Department Conference Committee (resolution of math instruction)  
2001-2002  Member  Ten-Year Chair Review Committee (MME)  
2001-2002  Member  Search Committee: CECS Assistant Dean  
2001-2002  Chair  Ph.D. PCC Sensor Signal and Image Processing  
2001-2002  Member  ad-hoc Engineering Math Course Development (precursor of EGR 101)  
2000-2001  Chair  Ph.D. PCC Sensor Signal and Image Processing  
2000-2001  Member  Undergraduate Petitions Committee  
1999-2000  Chair  Ph.D. PCC Sensor Signal and Image Processing  
1999-2000  Member  Undergraduate Petitions Committee  
1998-1999  Member  Engineering First-Year Sequence (resulting in EGR 190-191)  
1998-1999  Chair  Ph.D. PCC Sensor Signal and Image Processing  
1997-1998  Chair  Ph.D. PCC Sensor Signal and Image Processing  
1997-1998  Member  Ph.D. Admissions  
1996-1997  Member  Five-Year Chair Review Committee (EE)  
1996-1997  Chair  Petitions Committee  
1995-1996  Chair  Petitions Committee  
1995-1996  Member  Petitions Committee  

Department Committees:  
2000-2008  Chair  Department of Electrical Engineering  
Various  Chair and/or Member  All Department Committees  

Professional Service:  
Conference Co-Chair and Member Technical Program Committee, SPIE 2000-2015.  
Co-Organizer AFRL ATR Center Workshop, WSU, Dayton, 2009-2014.
Major Accomplishments:

During my first ten years at Wright State University, I focused on the development of curriculum and programs in the EE department resulting in, for example, the offering of engineering (EGR) and electrical engineering (EE) first-year course sequences, and aiding the institution and codification of our engineering Ph.D. program. These and other efforts led to my successful consideration as department chair effective Fall 2000.

During my tenure as department chair (2000 – 2008):

- Undergraduate student head count increased from 197 to 218 (+10%)
- Graduate student head count increased from 146 to 233 (+59%)
- Full-time faculty count increased from 9 to 12 (+33%).
- Publications per Faculty per Year increased from 2.7 to 4.7 (+74%).
- Research Expenditures per Faculty per Year increased from $34,400 to over $131,000 (+280%).
- The EE department moved from the least productive to the most productive department in the college in regard to research expenditures.

Additionally, during this period the Department of Electrical Engineering facilitated collaborative research efforts including at least twenty workshops were hosted as part of the SAVig, RAPCEVAL, NEWSTARS, and ATR Center programs, and for special topic areas such as ATR theory, image registration and geo-location, and micro-sensing. The Department also facilitated arrangements and appointments for visiting scientists, faculty, and researchers from outside agencies, and provided AFRL on-site research infrastructure and manpower in the form of contracted researchers and IPA assignments.

Since 2008, I have focused efforts on building and maintaining collaborative research programs, transitioning academic programs and on-line offerings, and serving in various leadership roles at the college and university levels.
Resume

Dr. Steve Gorman
301 Stewart Dr
Yellow Springs, Ohio 45387
850-748-3069

PROFESSIONAL EXPERIENCE

January 2014 - Present

Electrical Engineering Instructor at Wright State University, Dayton, Ohio

Develop and teach undergraduate and graduate Electrical Engineering courses

June 2007 - January 2014

Principal investigator at Ticom Geomatics, Inc Austin, Tx.

This position involved research and development in geolocation, communications and signal processing. My duties during this time included

- Developed novel signal processing and geolocation concepts to acquire R&D and other funding from various government agencies
- Performed many customer briefings for program management reviews and briefings for acquisition of new business
- Acted as technical lead and chief system engineer for Ticom Geomatics in many business areas such as geolocation of new signals including cellular signals such as GSM, CDMA2000, WCDMA, WiMax and LTE. Many other classified signals are included as well.
- Lead planning and lead system test events at test ranges such as YUMA, NTC (Fort Irwin) , Idaho national labs (INL) and many local field tests in Austin, Tx. for numerous projects
- Planned and oversaw integration of new capabilities into Ticom Geomatics baseline system software
- Managed technical teams in development of multiple new signal processing and geolocation algorithms and projects
- Developed most all of Ticom Geomatics concepts of operation (CONOPS) for new signal geolocation capabilities
- Performed duties as chief technical advisor to Ticom Geomatics company owners.
- Continued to developed signal processing Algorithms in Matlab as time permitted
August 2004 - June 2007

Associate Professor (with Tenure earned in 2005) at the University of West Florida/University of Florida ECE program (ABET Accredited). See accomplishments, courses taught and publications in latter sections.

August 2000 – May 2004

Assistant Professor at the University of West Florida/University of Florida ECE program (ABET Accredited)

May 2001 – June 2007

Part time Consulting

This position involved research and development in radio location, communications and signal processing. My work has focused on TDOA/FDOA radio location signal processing of analog and digital signals. My duties during this time included:

- Demodulation algorithm development for signals including: Thuraya OQPSK, GSM, HF-ALE, 802.11, IS-136 and other special signals
- Supervised development of algorithms for CDMA2000, WCDMA
- Developed various synthetic geolocation algorithms
- Blind beamforming algorithms
- Single node geolocation algorithms
- OFDM signal algorithms and simulations
- Support presentations and meetings

June 1988- July 2000

Engineering Fellow, Raytheon Systems Company, formerly E-Systems

This position was generally in the areas of signal processing and communications systems. However, I have also worked on a variety of projects involving control theory, digital and analog circuit design, power supplies, electromagnetic, software and systems engineering. Some of my experience and accomplishments at Raytheon are listed below.

- Developed, simulated and implemented various demodulation algorithms for FSK, MPSK, QAM, SSB-AM, FM, and TCM signals. This included timing recovery and DSP based carrier phase recovery algorithms, as well as equalization techniques including CMA, linear and decision feedback equalization and Viterbi equalizers.
- Developed, simulated and guided implementation of algorithms for a highway position system above a magnetic tape. Developed electromagnetic models for the system.
Applied noise rejection techniques from digital signal processing and digital communications theory to this application.

- Developed and simulated algorithms for TDOA based geolocation system which targets frequency hopping radios. This resulted in a 5 million dollar DARPA contract. Developed a novel baud timing approach which does not use cross correlation. Performed the system simulation for the project. Performed much of the hardware and software development and guided the project through system integration.
- Performed analysis on data collected from a direct sequence spread spectrum radio which frequency hops and is time division multiplexed.
- Simulated various spatial DSP based beam forming and interference cancellation algorithms
- Performed various analog circuit designs including duobinary demodulator, automatic gain control, analog filters, analog equalizers and power conditioning circuits.
- Developed a new method of geolocation of a transmitter with a single antenna collection system. A patent was granted for this technique.
- Designed several FIR, IIR, and multirate digital filters for various projects. Simulated these in Matlab and implemented many in “C” code.
- Designed and simulated a feedback control system for very fast positioning of a Laser based on Galvanometer mirror movements. The design used modern control state feedback techniques and a new design technique was developed.
- Evaluated implementation of synthetic aperture radar on reduced size CRAY computer.
- Developed algorithms for real time detection/collection of frequency hopping radios. This resulted in a 10 million dollar contract award to build such a system. The system was completed and is now operational. The algorithms included a novel tracking algorithm to de-interleave pulses, detection algorithm, and a novel clustering algorithm to eliminate adjacent channel energy false alarms. Other algorithm work was involved including FFT based polyphase channelization, baud rate and phase estimation, and radio network association.
- Developed and simulated a novel implementation for a variable rate FFT based polyphase channelizer.
- Developed a new partial column pipeline FFT algorithm that was published.
- Performed in depth analyses study of many FFT algorithms for hardware implementation using custom parallel processors.
- Performed various digital logic hardware designs using PLDs and Xilinx devices.
- Designed, built prototype, and tested a correlator card for timing recovery for a four level FSK receiver which frequency hops. This involved of both analog and digital circuit design.
- Designed, simulated, built prototypes, and tested many mixed analog/digital phase locked loops.
- Designed and build hardware test cards to identify and fix a long standing timing problem with a frequency hopping communications system.
- Developed a variety of embedded real-time software, both “C” and assembly language for DSP and non DSP applications.
- Developed a variety of workstation software in “C” and Matlab for simulation of various signal processing, communications, and control systems applications.
EDUCATION

Ph.D. in Electrical Engineering, University of Kentucky - May 1988.
MS in Electrical Engineering, University of Kentucky - Dec 1985.
BS in Electrical Engineering, University of Kentucky - Dec 1982.

PUBLICATIONS:

1. “Blind Beamforming for Enhanced T/FDOA Geolocation”, B. E. Henneberger, S. F. Gorman, S. D. Richardson, B.K. Craig. 5th Symposium on Radiolocation and Direction Finding, Southwest Research Institute, San Antonio, TX, May 4, 2004 (18 pages)


**TECHNICAL CONSULTING REPORTS WRITTEN WHILE AT UWF**


Effects of error correction coding and Eb/No requirement for the 16 QAM – 8 channel OFDM system. Prepared for ACS Defense, Inc. August 2001
EXTERNAL RESEARCH FUNDING RECEIVED WHILE AT UWF

- Spring 2001 – “Airborne Communications Node Phase II” from Raytheon, Inc. Falls Church, Virginia. Amount of contract was $4381.00
- Spring 2003 – “Adaptive Beamforming for T/FDOA Geolocation” from TICOM, Inc. Austin Texas. Amount of contract was $45,000.00
- Fall 2003 – “Adaptive Beamforming for T/FDOA Geolocation phase II” from TICOM, Inc. Austin Texas. Amount of contract was $11,330.00

TEACHING EXPERIENCE

Courses Taught at University of West Florida

EEL 3112 - Circuits 2 (continuous time signals and systems)
EEL 3135 - Signals and Systems
EEL 4713C - Computer Architecture and VHDL laboratory
EEL 3472 - Electromagnetic Fields and Waves
EEL 4306C - Electronics II and associated laboratory
EEL 4514 - Communications Systems
EEL 4514L - Communications laboratory
EEL 4515 - Digital Communications
EEL 4914C - Senior Design
EEL 4905 - Individual Problems in Electrical Engineering
EEL 4657L - Linear Controls Laboratory
EEL 4635 - Digital Control Systems

Courses Taught at George Mason University, Fairfax, Virginia

ECE 463 - Digital Communications Systems
ECE 521 - Graduate level modern systems theory (state space systems)
ECE 421 - Classical feedback control systems
ECE 422 - Discrete time feedback control systems
ECE 445 - Computer Architecture.
ECE 286 - Circuits II

Courses Taught at University of Kentucky

EE 480 - Junior level digital logic design
EE 583 - Senior/Graduate level microprocessors

UNIVERSITY SERVICE ACTIVITIES

- Former Member of CAS council
- Former Member of CAS governance sub committee
- Faculty advisor to the student branch of the IEEE
• Faculty advisor to the student branch of the Florida Engineering Society (FES)
• Former chair of the ECE curriculum committee – current member
• Former member of several faculty search committees
• Member of the ECE Fort Walton Beach expansion committee
• Faculty advisor to, and instructor of the UWF Brazilian Jiu-Jitsu sports club
• Member of two ABET accreditation preparation committees
• Chair of Fall 2004/Spring 2005 ECE faculty search committee
• Member of ECE department outcome assessment and retention committee
• Chair of ECE department student employment, Co-op and Alumni relations committee

AWARDS AND MISCELLANEOUS

• UWF Electrical and Computer Engineering Department Professor of the Year award, December 2003
• UWF Electrical and Computer Engineering Department Professor of the Year award, December 2001
• U.S. Patent no. 5502450 single antenna direction finding system., March 1996.
• Received The E-Systems annual award for individual technical excellence, June, 1992.
• Licensed Professional Engineer in Kentucky.
• University of Kentucky Graduate Fellowships 1986, 1988.
• Recognized by Kentucky society of professional engineers for being one of three individuals (out of 12,000) to achieve a perfect score on the national professional electrical engineering exam in 1988.
• Eastman Kodak scholarship for most outstanding EE student, 1981.

DOD CLEARANCE: TS/SI/TK
RESEARCH INTERESTS

EDUCATION
1966-1971 Department of Electronics, Technical University of Warsaw, Warsaw, Poland.
1972-1973 Post Graduate Study in Engineering Education, Technical University of Warsaw, Warsaw, Poland.

DEGREES
1971 M.S. 
Thesis: "Gunn’s diode oscillator for X-band with varactor tuning"
Advisors: Professor Adam Smolinski and co-adviser Professor Janusz Dobrowolski
Department of Electronics, Technical University of Warsaw, Warsaw, Poland

1978 Ph.D. 
Dissertation: "High-efficiency tuned power transistor amplifier"
Advisor: Professor Jan Ebert
Department of Electronics, Technical University of Warsaw, Warsaw, Poland

1984 D. Sci. 
Dissertation: "High-efficiency tuned power amplifiers, frequency multipliers, and oscillators," Warsaw Technical University Publisher, pp. 1-143, Warsaw 1984
Department of Electronics, Technical University of Warsaw, Warsaw, Poland

PROFESSIONAL ACADEMIC EXPERIENCE
1972-1978 Instructor, Department of Electronics, Technical University of Warsaw, Warsaw, Poland
1978-1984 Assistant Professor, Department of Electronics, Technical University of Warsaw, Warsaw, Poland

Courses taught: High-Frequency High-Power Techniques
Radio Transmitters
Electromagnetic Field Theory
Microwave Theory and Technique
Electronic Measurements
Fundamentals of Electronics
Circuit Theory
Electronic Circuits and Systems
Radio Transmitters Laboratory
Radio Receivers Laboratory
Electronics Laboratory
Radio Electronics Laboratory, Chair, 1978-1984
Electronic Apparatus Laboratory, Chair, 1978-1984.
1984-1985  Visiting Professor, Department of Electrical Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061
Courses taught  EE3101  Electromagnetic Fields
                EE3201  Electronics I
                EE3202  Electronics II
                EE4201  Electronic Circuits and Systems I

1985-1990  Assistant Professor, Department of Electrical Engineering, Wright State University, Dayton, OH 45435
1990-1994  Associate Professor, Department of Electrical Engineering, Wright State University, Dayton, OH 45435
1994-pres   Professor, Department of Electrical Engineering, Wright State University, Dayton, OH 45435
Courses taught  EE 331/531  Electronic Devices
                EE 431/631  Electronic Circuits
                EE 434/634  Electronic Circuits Laboratory
                EE 444/644  Linear Integrated Circuits
                EE 449/649  Pulse and Digital Circuits
                EE 499/699  Special Problems in Engineering
                EE 741  Power Semiconductor Devices
                EE 742  Power Electronics II
                EE 743  Power Electronics III
                EE 744  RF Power Amplifiers
                EE 890  Independent Studies
                EE 899  Ph. D. Dissertation
                EGR 891  Ph.D. Seminar

ADVISING  17 Ph.D. students
           81 M.S. students
           6 post-doctoral positions
           3 sabbatical positions

PROFESSIONAL NON-ACADEMIC EXPERIENCE
1984  Design Automation, Inc., 809 Massachusetts Avenue, Lexington, MA 02173, (617) 862-8998
      Project Engineer responsible for designing high-efficiency switching-mode dc/dc converters
1991  Wright-Patterson AFB, Wright Laboratory, Dayton, OH, Summer Faculty Fellowship
1995  Wright-Patterson AFB, Wright Laboratory, Dayton, OH, Summer Faculty Fellowship
1996  Wright-Patterson AFB, Wright Laboratory, Dayton, OH, Summer Faculty Fellowship

PROFESSIONAL MEMBERSHIPS
IEEE, Fellow  2005-present
IEEE, Senior Member  1991-2004
Power Electronics Society  1991-present
Circuit and Systems Society  1991-present
Industrial Electronics Society  1991-present
Aerospace and Electronic Systems Society  1991-present
Industry Applications Society  1991-present
Tau Beta Pi  1992-present
Electrical Manufacturing and Coil Winding Association  1991-present
EMCWA, Board of Directors  1991-present
American Society for Engineering Education  2007-present

AWARDS
1977  President of the Technical University of Warsaw
1978  President of the Technical University of Warsaw
1979  President of the Technical University of Warsaw
1980  President of the Technical University of Warsaw
1981 Minister of Science, University Education, and Technology
1982 Minister of Science, University Education, and Technology
1983 Polish Academy of Sciences
1984 President of the Technical University of Warsaw
1985 Minister of Science, University Education, and Technology
1990 Harrel V. Noble Award, IEEE Dayton Section
1991 Excellence in Research Award, College of Engineering and Computer Science, Wright State University
1991 Presidential Award for Faculty Excellence in Research, Wright State University
1993 Excellence in Teaching Award, College of Engineering and Computer Science, Wright State University
1993 Nominated for the Presidential Teaching Excellence Award, Wright State University
1994 Nominated for the Presidential Teaching Excellence Award, Wright State University
1994 Electrical Manufacturing and Coil Winding for outstanding contribution
1995 Award for Outstanding Professional Achievement, the Affiliate Societies Council of the Engineering and Science Foundation of Dayton
1995 Outstanding Faculty Member, College of Engineering and Computer Science, Wright State University
1995 Presidential Award, Outstanding Faculty Member, Wright State University
1996-2000 Brage Golding Distinguished Professor of Research Award, Wright State University
1997 Excellence in Professional Service Award, College of Engineering and Computer Science, Wright State University
1997 Nominated for the Presidential Professional Service Award, Wright State University
2000 Excellence in Teaching Award, College of Engineering and Computer Science, Wright State University
2000 Nominated for the Presidential Teaching Award, Wright State University
2002 Excellence in Professional Service Award, College of Engineering and Computer Science, Wright State University
2002 Nominated for the Presidential Professional Service Award, Wright State University
2003 Excellence in Research Award, College of Engineering and Computer Science, Wright State University
2004 Board of Trustees’ Award for Faculty Excellence, Wright State University (This is the highest award given by Wright State University. “It is intended to honor those who serve as the most outstanding of role models for all faculties.”)
2005 Finalist for the Excellence in Teaching Award, College of Engineering and Computer Science, Wright State University
2006 Nominated for Robert J. Kegerreis Distinguished Professor of Teaching by CECS
2007 Nominated for Robert J. Kegerreis Distinguished Professor of Teaching by CECS
2007 Finalist for the Excellence in Teaching Award, College of Engineering and Computer Science, Wright State University
2008 Nominated for Robert J. Kegerreis Distinguished Professor of Teaching by CECS
2008 Outstanding Teacher Award from the American Society for Engineering Education, North-Central Section.
2008 Excellence in Teaching Award, College of Engineering and Computer Science, Wright State University.
2008 Nominated for the 2009 Kyoto Prize in Advanced Technology.
2009 National Professor of Technical Sciences of Poland conferred by the President of the Republic of Poland.
2009 Nominated for Robert J. Kegerreis Distinguished Professor of Teaching by CECS.
2009-2013 Robert J. Kegerreis Distinguished Professor of Teaching, Wright State University.
2010 Award from the Senate of the State of Ohio.
2010 Southwestern Ohio Council for Higher Education (SOCHE) Teaching Award.
2010 Green County Achievement Award
2014-2018 Frederick A. White Distinguished Professor of Professional Service, Wright State University

PUBLICATIONS

Books


**Peer-Reviewed Archival Journal Articles**


2009


2010


2011


2012


2013


2014


2015


Accepted Papers


Submitted Papers


13


**Conference Papers**


54. M. Bartoli, A. Reatti, and M. K. Kazimierczuk, "Off-line full-range high-frequency high-efficiency Class D^2 resonant power supply," Proceedings the IEEE International Conference on Industrial Electronics, Control, Instrumentation, and Automation (IECON'94), Bologna, Italy, September 5-9, 1994, pp. 159-163.


2010


2011


2012


2013


2014


2015


Citations

1. ISI Thomson-Reuters Science Citation Index, Web of Science, Web of Knowledge: 2602 citations of journal papers. The average citation of journal papers per paper = 16.08 and h-index = 31.

2. Google Scholar: 7515 citations, h-index = 44, i10-index = 152. Since 2009, 4478 citations, h-index = 33, i10-index = 106.


4. Top Authors in Engineering, 229-th position in the world, 154-th in USA, 2-nd in Ohio.

5. Top Authors in Electrical & Electronic Engineering, 75-th position in the world, 52-nd in USA, 2-nd in Ohio.

Productivity

Approximately 4.5 articles in top international archival referred journals per year, 5 international conference papers per year, and 1 book per 2 years for the last 24 years. Grants and contracts include NSF, National Academy of Science, DOE, DOD, DARPA, and industry.

Journal Articles (In Polish)


Conference Papers (In Polish)


In Russian:

PATENT INFRINGEMENT EXPERTISE

Served as an expert witness and participated in many patent litigations and patent invalidations.

TECHNICAL REPORTS


RESEARCH CONTRIBUTION
The objectives of my professional life have been the inquiry and advancement of knowledge and perform research for the benefit of humanity. I always wanted to be a good educator and researcher. My research has high practical relevance. It is transformative in nature. I have tried to achieve a sustained record of excellence and to make profound contribution to the field. A testimony to the quality of my research are peer reviewed archival journal papers, conference papers, and monographs at a high international level. My articles are published in the best peer-reviewed international journals and international conference proceedings, which are indexed in the leading databases of science and engineering, such as Thomson-Reuters ISI Science Citation Index and scholar.google.com. My monographs are published by top internationally recognized publishers, such as John Wiley & Sons, Prentice-Hall (Pearson), and IEEE Press. One of the main objectives of my research is to reduce the dependence of mankind on fossil fuel. The major contributions of my research are as follows:

1. Major and lasting contributions to the invention and development of electronic ballasts for fluorescent lamps. A multibillion dollar industry has been created. Electronics ballasts improve the quality of artificial light by eliminating the flickering and producing healthy light. They also improve the power quality by reducing current harmonics in utility power lines, increasing power factor, lowering electromagnetic pollution, and protecting environment. Electronic ballasts drive fluorescent lamps at high frequencies. Traditional incandescent bulbs convert only 5% of energy into artificial light and 90% of energy into heat. The efficiency of fluorescent lamps is over five times higher than that of incandescent lamps, thereby saving a large amount of energy. This invention was adopted quickly and rapidly diffused around the world. A new research discipline has been created. There are special issues on electronic ballasts in the top international archival journals and conference sessions. Fluorescent lamps driven by electronic ballasts have become the core of the worldwide lighting market. European Union has decided to replace all low-efficiency incandescent bulbs by fluorescent tubes with electronic ballasts. Electronic ballasts are a significant component of "green energy technology." The invention of electronic ballasts has a worldwide impact by improving of quality of life and saving energy. The U.S. Congress has set 2012 as the year in which the U.S. will phase out incandescent bulbs. Australia has chosen 2010 as its deadline to eliminate incandescent bulbs. European Union will eliminate all incandescent bulbs by 2012; 100 W bulbs by 2009, 75 W bulbs by 2010, 60 W by 2011, and 40 W and 25 W by 2011. The energy savings by replacing incandescent bulbs with fluorescent lamps is estimated to be $70 billion per year. It also reduces the emission of CO2 by 15 mln tons a year. This has been an extraordinary and lasting contribution with a global impact for the greater good of humanity and the world. On September 20, 2010, General Electric made the last incandescent bulb.

2. Invention of the Class E RF zero-voltage switching power oscillator.
3. Invention of the Zeta (dual SEPIC) dc-dc converter widely used in industry.
5. Invention of the Class E RF zero-current switching power amplifier.
6. Invention of the RF Class F power amplifier with quarter-wave transmission line.
7. Invention of high-frequency Class E rectifiers.
8. Derivation of small-signal circuit models of switching-mode PWM dc-dc power converters. These models are widely used for studying dynamic performance of dc-dc power converters and designing control circuits.
9. Derivation of a model for current-mode controlled PWM dc-dc converters. This model is useful in designing two-loop control circuits for PWM dc-dc power converters.
10. Contributions to analysis and design of PWM dc-dc converters (including a monograph and graduate textbook by John Wiley & Sons, 2008)
11. Development of high-efficiency high-frequency power amplifiers and RF transmitters, including Class E and Class D switching-mode power amplifiers (including a monograph and graduate textbook by John Wiley & Sons, 2008). Class E amplifier is the most efficient transmitter used in wireless communications.
14. Analysis and design of high-frequency magnetic components.
15. Development of microwave microscope, used in testing superconductors and other materials, including biological tissues.
16. External research funding from the most competitive federal agencies, like NSF, National Academy of Science, and Department of Energy.
17. Science Citation Index shows over 2000 citations and h-index = 28. Google Scholar shows 5589 citations, h-index=42, and i10-index = 126.
NEW COURSES DEVELOPED

EE 7410 Power Semiconductor Devices
EE 7420 Power Electronics
EE 7430 Power Electronics III
EE 8800 RF Power Amplifiers
EE 7440 Independent Studies
EE 8980 Ph.D. Dissertations
EGR891 Ph.D. Seminar
EE 3310 Electronic Devices
EE 332 Electronic Devices Laboratory
EE 431 Electronic Circuits
EE 432 Electronic Circuits Laboratory
EE 434 Electronics Laboratory
EE 4440 Linear Integrated Circuits (course and laboratory)
EE 449 Digital Electronics Laboratory
EE 499 Independent Studies

The objectives of his teaching activities have been to develop, advance, disseminate, and exploit knowledge. He as developed, has been maintaining, and updating a sequence of hardware laboratories in the area of electronics for undergraduate students of electrical engineering and computer engineering departments: EE332, EE432, EE434, EE444, and EE449. He has been responsible for all electronics courses and laboratories in the Department of Electrical Engineering for over 25 years. He has written an undergraduate text book: Electronic Devices: A Design Approach, Prentice Hall, 2004 and a Laboratory Manual to Accompany Electronic Devices: A Design Approach, Prentice Hall, 2004.

He has developed a sequence of four graduate courses in the area of power electronics for graduate M.S and Ph.D. students: EE7410, EE 7420, EE7430, and EE7440.

1. EE7410 covers fundamental characteristics and simulation models of power devices, such as silicon (Si) and silicon-carbide (SiC) power MOSFETs, power junction and Schottky diodes, and IGBTs. In addition, power stages of PWM switching dc/dc converters are analyzed. A computer laboratory has been also developed.

2. EE7420 Power Electronics derives small-signal linear time-invariant models of power stages of PWM converters for continuous and discontinuous conduction modes. Using these models, transfer functions and step responses of power stages of PWM converters are derived. Voltage-mode control, current-mode control, and feed-forward strategies are discussed in detail. A computer laboratory has been also developed.

3. EE7430 High-Frequency Magnetic Components covers properties of magnetic materials, magnetic cores, complex permeability, core losses, eddy currents, skin effect, proximity effect, Dowell’s equation, winding losses, losses caused by harmonics, self-capacitance, and design of power inductors and transformers.

4. EE7440 Power Electronics III covers RF resonant power amplifiers, high-frequency power dc/ac inverters, high-frequency rectifiers, and high-frequency magnetic devices. The theory is illustrated by design projects. For this course, he has written a graduate text book: Resonant Power Converters, 1-st Ed., John Wiley & Sons, 1995, 2nd Ed., 2011.

All the four courses are non-required and attract 60 to 105 graduate students every quarter or semester. His teaching and research brings a healthy balance of scientific progress and spiritual depth.

LABORATORY DEVELOPMENT AND SUPERVISION

1. Developed and supervises student hardware laboratories for undergraduate courses EE332, EE432, EE444, and EE449.

2. Has written and published by Prentice-Hall a laboratory manual for these laboratories.

3. Developed and supervises software and hardware student laboratories for graduate courses EE7410, EE7420, EE7430, and EE7440.
COURSE DIRECTOR

EE331, EE332, EE431, EE432, EE401, EE444, EE449, EE741, EE742, EE743, EE880, EE4440, EE7410, EE7420, and EE7440.

BOOKS

1. Two undergraduate textbooks with solutions manuals in electronics area published by Prentice-Hall.
2. Three graduate books with solutions manuals in power electronics area published by John Wiley & Sons

GTAs

Four my Graduate Teaching Assistants won the College Excellence in Teaching Awards: Brad Bryant, Simon J. Tritschler, Weston R. Earick, and Dakshina Murthy. Thomas R. Salvatierra was a finalist in 2008.

INVITED SEMINARS


M.S. GRADUATE STUDENTS SUPERVISED AT WRIGHT STATE UNIVERSITY

1. Xung T. Bui M.S.E.E. 1988
4. Abdulkarim A. Abdulkarim M.S.E.E. 1992
5. Nandakumar Thirunarayan M.S.E.E. 1992
6. Dung Q. Vuong M.S.E.E. 1992
7. Dariusz Czarkowski M.S.E.E. 1993
8. Venkatramani Swaminathan M.S.E.E. 1993
11. Peter T. Lamm M.S.E.E. 1994
13. Chuyun Wu M.S.E.E. 1994
15. Kevin L. Thayer M.S.E.E. 1994
17. Sonny Nguyen M.S.E.E. 1994
19. Makarand Vichare M.S.E.E. 1996
20. ASM Nazirul Shaheen M.S.E.E. 1997
22. Carlos M. Cordoza M.S.E.E. 1997
23. LaVern Starman M.S.E.E. 1997
28. Masoud Pourali M.S.E.E. 1999
29. David Hanna M.S.E.E. 2000
30. Brad S. Bryant M.S.E.E. 2000
31. Ronald L. McDonald M.S.E.E. 2000
32. Skip Shattuck M.S.E.E. 2000
33. Kenroy Howard M.S.E.E. 2000
34. Jeffrey Allen Ross M.S.E.E. 2001
35. Anders P. Walker M.S.E.E. 2002
36. Erich J. Kring M.S.E.E. 2002
37. Mahbuba Rahman M.S.E.E. 2003
38. Simon Joe Tritschler M.S.E.E. 2003
39. Benjamin J. Gerten M.S.E.E. 2003
40. Bharath Tannener M.S.E.E. 2004
41. Chris A. Evans M.S.E.E. 2004
42. Donald E. Peters M.S.E.E. 2004
43. Subash P. Ramakrishnan M.S.E.E. 2005
44. Melaka P. Senadeera M.S.E.E. 2005
45. Kim Ying Wong M.S.E.E. 2005
46. Emad M. Al-Tabakha M.S.E.E. 2005
47. Nisha Das M.S.E.E. 2005
48. Dakshina Murthy M.S.E.E. 2006
49. Weston R. Earick M.S.E.E. 2006
50. Derrick N. Langley M.S.E.E. 2007
52. Veda Pakakash N. Galigekere M.S.E.E. 2007
53. Hamdi Abdelbagi M.S.E.E 2007
54. Thomas Lange M.S.E.E. 2008
55. Mandar D. Kavimanden M.S.E.E. 2008
56. Manish Dalal M.S.E.E. 2009
57. Gary Richard Doss M.S.E.E. 2009
58. Daniel J. Whitman M.S.E.E. 2010
59. Jeremy D. Gassmann M.S.E.E. 2010
60. Thomas R. Salvatierra M.S.E.E. 2010
61. Venkata Sai Aditya Kumar Choragudi M.S.E.E. 2011
62. Dhiyva Ammanambakkam Nagarajan M.S.E.E. 2011
63. Ramchandran Mahendrabhai Kotecha M.S.E.E. 2011
64. Curt Zackiewicz M.S.E.E. 2011
65. Agasthya Ayachit M.S.E.E. 2011
66. Keshava Gopalakrishna M.S.E.E. 2013
67. Ramayya J. George M.S.E.E. 2014
68. Sourav Dey M.S.E.E. 2014
69. Shweta Chauhan M.S.E.E. 2014
70. Kevis Craig M.S.E.E. 2014
71. Nagasri Kollipara M.S.E.E. 2014
72. Aishwarya Raypati M.S.E.E. 2014
73. Dalvir K. Saini M.S.E.E. 2015
74. Lokesh Kathi M.S.E.E. 2015
75. Ankit Chadha M.S.E.E. 2015
76. Manohar Sambhangi M.S.E.E. 2015
77. Shalini Nagaraj M.S.E.E. 2015
78. Vivek Kumar H. M.S.E.E. 2015
79. Alex Compton M.S.E.E. 2015

Total 72 MS Students

Also, advised 36 M.S. students at the Department of Electronics, Warsaw University of Technology, Warsaw, Poland.
PH.D. STUDENTS
1. Karl S. Gudmundsson 2004, Assoc. Prof., Dean, Keilir Institute of Technology, Island, karlsg@keilir.net, (354) 821-5664
2. Brad S. Bryant 2004, Design engineer, Dayton-Phoenix Co., Dayton, OH, brad@bcaudio.biz.
3. Richard A. Kleismit 2005, Assistant Research Prof., Physics Department, Wright State University
4. Donald J. Kessler 2005, University of Dayton, (Formally General Dynamics), Dayton, OH, klesz@earthlink.net, (937) 429-8857
5. Greg Gazzell 2009, Wright-Patterson Research Laboratory, US Air Force Base, Greg.Gazzell@wpafb.af.mil
6. Simon Joseph Tritschler 2010, Department of Biomedical, Industrial, and Human Factor Engineering, Wright State University
7. Nisha Kondrath 2010, Assistant Professor, Department of Electrical and Computer Engineering, Villanova University, Villanova, PA 190850 (formally Assistant Professor, University of Minnesota-Duluth, Swenson College of Engineering, Department of Electrical and Computer Engineering, Duluth, MN, das.nisha@gmail.com, Tel.: (218) 726-6385); 2-12-, Villanova University, Department of Electrical and Computer Science, Philadelphia, PA.
8. Dakshina Murthy-Bellur 2011, Assistant Professor, Penn State Erie, School of Engineering, Department of Electrical, Computer, and Software Engineering, REDC 166, 5101 Jordan Road, Erie, PA 16563-6153 (814) 898-7169, dsm19@psu.edu
9. Robert Carl Fitch, Jr. 2011, Air Force Research Laboratories, WPAFB, Dayton, OH, Rob-Fitch@wpafb.af.mil
10. Veda Prakash N. Galigekere, 2012, Senior electrical engineer, Lear Co., 21557 Telegraph Rd, Southfield, MI48033, VGaligerkere@lear.com
11. Julie J. Lee 2012, Case Western Reserve University, Dept of Electrical Eng., Cleveland, OH; 2013-, Emerson, Cleveland, OH;.
14. Thomas R. Salvatierra Passed Qualifying Exam, Candidacy Exam (01/12/2010), Candidacy exam (07/23/13)
15. Agasthya Ayachit Passed Qualifying Exam, Candidacy Exam (12/12/2013),
16. Weston R. Earick Passed Qualifying Exam, Candidacy Exam, Research Proposal, 8/17/10
22. William C. Quinn Started (8/25/2012)
23. Griffith Andrew Restarted (F2012)

STUDENTS TEACHING AWARDS
1. Brad S. Bryant 2002
2. Simon Joseph Tritschler 2005
3. Weston R. Earick 2003
5. Simon Joseph Tritschler 2010

STUDENTS RESEARCH AWARDS
1. Brad S. Bryant 2003 - 2004
2. Dakshina Murthy-Bellur 2009 - 1010

UNDERGRADUATE STUDENT SCHOLARSHIPS
Attracted over $460,000 (about $22,000 per year) for student scholarships from the Electrical Manufacturing and Coil Winding Association (EMCWA) for the last 20 years.
GRADUATE STUDENT SUPPORT
J. Jozwik (10 quarters), N. Thirunarayan (9 quarters), D. Czarkowski (10 quarters), D. Q. Vuong (8 quarters), M. Hoffman (4 quarters), M. Vichare (9 quarters), V. Garuda (4 quarters), D. Hanna (2 quarters), Nisha Das (1 quarter), Jeff Bouger (16 quarters), and Thomas Salvatierra (9.67 semesters).

Total Support (70.67 quarters)

POST-DOCTORS, SABBATICALS, AND RESEARCH ASSOCIATES
1. Wojciech Szaraniec
2. Alberto Reatti (sabbatical)
3. Massimo Bartoli
4. Antonio Massarini (sabbatical)
5. Andrea Armanni
6. Giuseppe Sancineto
7. Tadashi Suetsugu (sabbatical)
8. Kamon Jirasereamornkul

PATENTS

EQUIPMENT DESIGNED
High-frequency high-voltage tuned power amplifier for nuclear accelerator at \( f = 200 \text{ MHz} \) and \( V_o = 200 \text{ kV} \).
Meters for the power gain and the output power of high-frequency power transistors at 100, 175, and 400 MHz.
Radiotelephone for \( f = 175 \text{ MHz} \).
Meters of the distance of the Earth satellites.
Frequency multipliers for atomic frequency standard.
Meters of the cross-modulation distortion of PIN diodes.
Class E high-efficiency dc/dc converter at \( f = 2 \text{ MHz} \), \( V_o = 5 \text{ V} \), \( P_o = 50 \text{ W} \), and total efficiency over 75%.
Electronic ballast at \( f = 50 \text{ kHz} \), \( P_o = 80 \text{ W} \), and PF > 0.99.

GRANTS AND CONTRACTS
7. "Female and Minority Undergraduate Support Program," PI, NSF, Grant No. ECS-9246861, WSU No. 662060, 3/1/92-6/30/93, $15,000.
10. "Research Experience for Undergraduates Program", PI, NSF, Grant ECS-9345338, WSU No. 662341, 1/5/93 - 6/30/93, $15,000.
11. "Heat sensitive color system," Undergraduate Design Clinic Project, Standard Register Co., 09/15/94 - 06/10/95, $10,000.
18. "State Technologies Advancement Collaborative Program (STAC)," PI, US Department of Energy, Contract No. 541-0319-3, WSU No. 666349, 01/01/05-12/31/07, $315,500 ($98,000).


31. ``Reexamination of the perfect fluid model within general relativity form an engineering prospective in light of the accelerating expansion phenomenon," Pi, WSU No. 12-0740-10, $113,962, 10/01/2012-09/01/2013.

The total sum of external funding $1,236,242 + 440,000 and internal funding $35,700; TOTAL Ex-ternal Funding: $1,262,456 + $440,000 = $1,702,456.

REVIEWER OF TECHNICAL JOURNALS, N.S.F. and PUBLISHERS

IEEE Transactions on Circuits and Systems (15 papers a year)
IEEE Transactions on Power Electronics (10 papers a year)
IEEE Transactions on Aerospace and Electronic Systems (12 papers a year)
IEEE Transactions on Industrial Electronics (8 papers a year)
IEEE Transactions on Electron Devices (3 papers a year)
IEEE Transactions on Control Systems Technology (2 papers a year)
IEEE Transactions on Magnetics (2 papers a year)
IEEE Transactions on Industry Applications (2 papers a year)
IEEE Transactions on Electromagnetic Compatibility (3 papers a year)
IEEE Transactions on Education (3 papers a year)
IEEE Transactions on Dielectric and Electrical Insulation (2 paper a year)
IEEE Power Electronics Specialists Conference (15 papers a year)
IEEE International Symposium on Circuits and Systems (6 papers a year)
IEEE Proceedings, Pt. B, Electric Power Applications (10 papers a year)
IEEE Proceedings, Pt. G, Circuits, Devices and Systems (4 papers a year)
IEEE Proceedings on Control Theory and Applications (1 paper a year)
IEEE International Conference on Decision and Control (1 paper a year)
Journal of Power Electronics (3 papers a year)
Automatica (2 paper a year)
Electronic Letters (9 papers a year)
Solid-State Electronics (2 papers a year)
International Journal of Circuits Theory and Application (25 paper a year)
Journal of Circuits, Systems, and Computers (5 papers a year)
Analog Integrated Circuits and Signal Processing (1 paper a year)
COMPEL: Int. Journal for Computation and Mathematics in Electronics and Electrical Eng. (4 papers a year)
Archives of Electrical Engineering (1 year)
Emerald COMPEL: The International Journal for Computation and Mathematics in Electrical and Electronic Eng. (5 papers a year)
Hindawi Publishing Corporation, VLSI
European Conference on Circuit Theory and Design (2 papers a year)
Reviewer for Dept. of Energy (DOE) (4 proposals a year)
Reviewer for NSF (4 proposals a year)
National Academy of Science, USA (1 proposal a year)
John Wiley & Sons Publishers (4 books)
Prentice-Hall (3 books)
Elsevier Scientific Publishing Company (1 book)
West Publishing Company (2 books)
Research Grants Council (REG) of Hong Kong (3 to 5 research proposals per year)
European Research Council (3 research proposals)
# SERVICE AND ACADEMIC OUTREACH

## UNIVERSITY COMMITTEES

<table>
<thead>
<tr>
<th>Committee</th>
<th>Role</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Senate</td>
<td>Member</td>
<td>1997-1998</td>
</tr>
<tr>
<td>Senate Executive Committee</td>
<td>Member</td>
<td>1997-1998</td>
</tr>
<tr>
<td>Budget Review Committee</td>
<td>Member</td>
<td>1998-1999, 2001-2002</td>
</tr>
<tr>
<td>Research Council Committee</td>
<td>Member</td>
<td>2011-2013</td>
</tr>
<tr>
<td>Outside Interest Committee</td>
<td>Member</td>
<td>2011-2014</td>
</tr>
<tr>
<td>Graduate School Hearing Committee</td>
<td>Member</td>
<td>2012</td>
</tr>
<tr>
<td>Students Affairs Committee</td>
<td>Member</td>
<td>2011-2011</td>
</tr>
<tr>
<td>Graduate Policy Committee</td>
<td>Member</td>
<td>2000-2001</td>
</tr>
<tr>
<td>Agenda Committee</td>
<td>Member</td>
<td>1994-1997</td>
</tr>
<tr>
<td>Academic Dishonesty Hearing Panel</td>
<td>Member</td>
<td>1994-1998</td>
</tr>
<tr>
<td>Due Process Committee</td>
<td>Member</td>
<td>1995-1996</td>
</tr>
<tr>
<td>Strategic Planning Council Committee</td>
<td>Member</td>
<td>1995-1997</td>
</tr>
<tr>
<td>Academic Programs Sub-committee</td>
<td>Member</td>
<td>1995-1997</td>
</tr>
<tr>
<td>Tenure Removal Committee</td>
<td>Member</td>
<td>1998-2001</td>
</tr>
<tr>
<td>Library Committee</td>
<td>Member</td>
<td>1999-2001</td>
</tr>
<tr>
<td>Faculty Diversity Committee</td>
<td>Member</td>
<td>1999-2001</td>
</tr>
<tr>
<td>Petitions Committee</td>
<td>Member</td>
<td>2003-2005, 2012-2013</td>
</tr>
<tr>
<td>Parking Committee</td>
<td>Member</td>
<td>2005-2010</td>
</tr>
<tr>
<td>Civil Engagement Task Force Committee</td>
<td>Member</td>
<td>2004-2012</td>
</tr>
<tr>
<td>Faculty Budget Priority Committee</td>
<td>Member</td>
<td>2005-2006</td>
</tr>
<tr>
<td>Buildings and Grounds Committee</td>
<td>Member</td>
<td>2005-2006</td>
</tr>
<tr>
<td>Dining Services Committee</td>
<td>Member</td>
<td>2006-2007</td>
</tr>
<tr>
<td>Undergraduate Academic Program Review Committee</td>
<td>Member</td>
<td>2007-2011</td>
</tr>
<tr>
<td>Teaching and Learning Advisory Council</td>
<td>Member</td>
<td>2008-2010</td>
</tr>
<tr>
<td>Service-Learning Sub-committee of UCAP</td>
<td>Member</td>
<td>2009-2012</td>
</tr>
<tr>
<td>Search Committee, Dean of College of Eng. &amp; Comp. Sci.</td>
<td>Member</td>
<td>2010</td>
</tr>
<tr>
<td>Search Committee, Dean of College of Eng. &amp; Comp. Sci.</td>
<td>Member</td>
<td>2013</td>
</tr>
<tr>
<td>Research Integrity Committee</td>
<td>Member</td>
<td>2013</td>
</tr>
<tr>
<td>AAUP-WSU Bargaining Council Committee</td>
<td>Member</td>
<td>2010-11</td>
</tr>
</tbody>
</table>

## COLLEGE COMMITTEES

<table>
<thead>
<tr>
<th>Committee</th>
<th>Role</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steering Committee</td>
<td>Member</td>
<td>2000-2006</td>
</tr>
<tr>
<td>Steering Committee</td>
<td>Chair</td>
<td>2001-2002</td>
</tr>
<tr>
<td>Faculty Development Committee</td>
<td>Member</td>
<td>1995-1999, 2002-2004, 2007-2014</td>
</tr>
<tr>
<td>Teaching Committee</td>
<td>Chair</td>
<td>2003-2004</td>
</tr>
<tr>
<td>Teaching Committee</td>
<td>Member</td>
<td>2009-2011</td>
</tr>
<tr>
<td>Curriculum Committee</td>
<td>Member and Scribe</td>
<td>1988-1989, 2004-2006</td>
</tr>
<tr>
<td>Due Process Committee</td>
<td>Chair and Scribe</td>
<td>1992-1993</td>
</tr>
<tr>
<td>Ad Hoc Committee to Review Bylaws</td>
<td>Member and Scribe</td>
<td>1992-1993</td>
</tr>
<tr>
<td>Due Process Committee</td>
<td>Member</td>
<td>1991-1993</td>
</tr>
<tr>
<td>Teaching Award Committee</td>
<td>Member</td>
<td>1993-1997, 2001-2004, 2008-2012</td>
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<tr>
<td>Three-Year Review Committee of EE Department Chair</td>
<td>Member</td>
<td>1995-1996</td>
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<tr>
<td>Ph.D. Dissertation Qualified Faculty</td>
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<tr>
<td>Ph.D. Student Affairs Committee</td>
<td>Member</td>
<td>2003-2006, 2008-2010</td>
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<tr>
<td>Ph.D. Planning Committee</td>
<td>Member</td>
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<tr>
<td>Ph.D. Admissions Committee</td>
<td>Member</td>
<td>1998-2003</td>
</tr>
</tbody>
</table>
Ph.D. Program Coordinating Committee  Member  1996-2006
Ph.D. Steering Committee  Member  1998-2003
EE Chair Search Committee  Member  1998-2000
Math Ad Hoc Committee  Member  2000-2002
Ph.D. Review Committee  Member  2000-2001
Petition Committee  Chair  2003-2005
University Promotion and Tenure Committee  Representative  2006-2007
Senior Lecture Promotion Committee  Member  2008-2009
CSCE Ad-hoc Strategic Planning Advisory Committee  Member  2009-2010
Ph.D. Program Students Affairs Committee  Member  2012-2013

DEPARTMENT COMMITTEES

<table>
<thead>
<tr>
<th>Committee</th>
<th>Role</th>
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<tbody>
<tr>
<td>EE Faculty Development Committee</td>
<td>Member</td>
<td>1990-2006, 2009-12</td>
</tr>
<tr>
<td>Engineering Physics Program Committee</td>
<td>Co-Director</td>
<td>1993-2008</td>
</tr>
<tr>
<td>Engineering Physics Program Committee</td>
<td>Member</td>
<td>2008-2011</td>
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<tr>
<td>Curriculum Committee</td>
<td>Member</td>
<td>1988-2009</td>
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<tr>
<td>Curriculum Committee</td>
<td>Chair</td>
<td>2004-2005</td>
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<tr>
<td>Graduate Program Committee</td>
<td>Member</td>
<td>1986-1988, 1994-2008</td>
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<td>EE Undergraduate Studies Committee</td>
<td>Member</td>
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<tr>
<td>EP Undergraduate Studies Committee</td>
<td>Co-Director</td>
<td>2004-2006</td>
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<td>GTA Committee</td>
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<td>Laboratory Resources Committee</td>
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<td>Laboratory Resources Committee</td>
<td>Chair</td>
<td>2003-2006</td>
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<td>Electronics/VLSI Subcommittee</td>
<td>Chair</td>
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<td>Electronics/VLSI Subcommittee</td>
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<td>2003-2008</td>
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<td>EE Core Subcommittee</td>
<td>Member</td>
<td>2003-2006</td>
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<td>Bylaws Committee</td>
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<td>Bylaws Committee</td>
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<td>2002-2003, 2005-2007</td>
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<td>Telecommunications Faculty Search Committee</td>
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<td>VLSI Faculty Search Committee</td>
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<td>Ad Hoc Faculty Search Committee</td>
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<td>Academic Computing Committee</td>
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<td>2013-2014</td>
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PROFESSIONAL SERVICE

PANEL REVIEW OF RESEARCH PROPOSALS

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<thead>
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<th>Organization</th>
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<tr>
<td>U.S. Department of Energy</td>
<td>2011-2012</td>
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<tr>
<td>European Research Council (ERC)</td>
<td>2012-</td>
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<tr>
<td>Advanced Grant Panel</td>
<td>2012-</td>
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<tr>
<td>Hong Kong Research Grants Council</td>
<td>1998-</td>
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ASSOCIATE EDITOR

<table>
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<tr>
<th>Journal</th>
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<tbody>
<tr>
<td>IEEE Transactions on Industrial Electronics</td>
<td>2005-</td>
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<tr>
<td>IEEE Transaction on Circuits and Systems, I, Special Issue on Switching Circuits and Systems</td>
<td>August 2003</td>
</tr>
<tr>
<td>IEEE Transaction on Power Electronics, Special Issue on Lighting Applications</td>
<td>May 2007</td>
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<tr>
<td>International Journal of Circuit Theory and Applications</td>
<td>2008-</td>
</tr>
<tr>
<td>IET Circuits, Devices &amp; Systems</td>
<td>2013-</td>
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</table>
IEEE TECHNICAL COMMITTEE CHAIR
Technical Committee for Power Systems Electronics Circuits for the IEEE Circuits and Systems Society

IEEE CONFERENCE TRACK CHAIR
IEEE International Symposium on Circuits and Systems, Power Systems and Power Electronics Circuits
IEEE Power Electronics Specialists Conference, Topic Chair, Resonant Power Converters
2006

DISTINGUISHED LECTURER
IEEE Distinguished Lecturer for the Circuits and Systems Society
2004-2006

OHIO AEROSPACE INSTITUTE
Member of the Steering Committee of the Focus Group, "Aerospace Power and Propulsion"

CONFERENCE TECHNICAL PROGRAM COMMITTEE
IEEE Power Electronics Specialists Conference 1994-2004
IEEE Energy Conversion Congress and Exhibition 2010-2014
IEEE International Power Electronics Conference 1999-2000
International Conference of Electronics, Circuits, and Systems 2004-2006
IEEE International Conference on Power Electronics and Drive Systems, International Steering Committee 2007
Electrical Manufacturing and Coil Winding Association Conference Technical Program Co-Chair 2008-

SESSION CHAIR
1st IEEE Conference on Control Applications, Dayton, OH 1992
Session TP-4 Machines, Co-chair
IEEE Power Electronics Specialists Conference
Session 14 Topology IV: Power Factor Correction, Chair 1993
Session 18 Topology V: Converter Topologies, Chair
IEEE Midwest Symposium on Circuits and Systems 1996
Session: Antennas, Radar and RF Microwave Systems, Chair
IEEE International Symposium on Circuits and Systems, Atlanta, GA 1996
Organized and Chaired a Panel Session on Power Electronics
IEEE Power Electronics Specialists Conference 1996
Session: Passive Components 2, Chair
Session: Industrial Applications & Sensors I
Power Electronics Track for IEEE Intl Symposium on Circuits & Systems 2001
Associate Chair
IEEE International Symposium on Circuits and Systems, Sidney, Australia 2001
Organized and chaired two Special Sessions in Power Electronics
Midwest Symposium on Circuits and Systems 2001
Organized and chaired two Special Sessions in Power Electronics
IEEE International Symposium on Circuits & Systems, Phoenix, AZ 2002
Session Chair: Simulation of Power Electronic Circuits
IEEE International Symposium on Circuits and Systems, Bangkok, Thailand 2003
Session Chair: Power Converters
IEEE International Symposium on Circuits and Systems, Vancouver, BC, Canada 2004
Chair for Power Electronics Track and Power Systems Track
Session Chair: Power Converters
IEEE International Symposium on Circuits and Systems, Island of Kos, Greece 2006
Session Chair: Integrated Power Converters
Session Chair: Power Electronic Circuits
Session Chair: Power Integration
Session Chair: Control of Power Converters
Session Chair: Power Circuits
Session Chair: Power Integrated Circuits
IEEE Midwest Symposium on Circuits and Systems 2007
Session Chair: Power Electronic Circuits

TRACK CHAIR
IEEE International Symposium on Circuits & Systems, Phoenix, AZ 2002
Co-chair of Power Electronics Track
Session: Simulation of Power Electronic Circuits
IEEE International Symposium on Circuits and Systems, Bangkok, Thailand 2003
Chair for Power Electronics Track and Power Systems Track
Session: Power Converters
IEEE International Symposium on Circuits and Systems, Vancouver, BC, Canada 2004
Chair for Power Electronics Track and Power Systems Track
Session: Power Converters
IEEE International Symposium on Circuits and Systems, Kobe, Japan 2005
Co-Chair for Power Electronics Track and Power Systems Track
Session: Power Converter Circuits
IEEE International Symposium on Circuits and Systems, Island of Kos, Greece 2006
Chair for Power Electronics Track and Power Systems Track
Session: Integrated Power Converters
IEEE Power Electronics Specialists Conference, Jeju, South Korea, 2006
Track Chair for Resonant Converters
Chair for Power Electronics Track and Power Systems Track
Session: DC-DC Power Converters
Session Chair 2008
Electrical Manufacturing Association Conference, Nashville, TN, 2009
IEEE International Symposium on Circuits and Systems, Paris, France 2010
Review Committee Member (RCM)
Session Chair: Integrated & Wireless Power Circuits
Session Chair: Power Electronics I
Session Chair: Switched Capacitor Converters & Power Amplifiers
American Society of Engineering Education
Session Chair 2010
Electrical Manufacturing Association Conference, Dallas, TX
Program-Co-chair
Session Chair: Power Electronics
IEEE International Symposium on Circuits and Systems, Rio de Janeiro, Brazil 2011
Review Committee Member (RCM)
Session Chair: Power Electronics Circuits I
Session Chair: Power Converters II
IEEE International Symposium on Circuits and Systems, Soul, South Korea 2012
Review Committee Member (RCM)

SPECIAL ISSUES
Organized two Special Issues on Automotive Electronics in the Journal of Circuits, Systems, and Computers
Organized two Special Issues on Power Electronics in the Journal of Circuits, Systems, and Computers
Gust Editor for Special Issues on Switching Circuits and Systems in the IEEE Transactions on Circuits and Systems-I, No. 8, August 2003.
OTHER IEEE SERVICE
IEEE Power Electronics Society Superconductivity Committee, Representative 1992-1999

Electrical Manufacturing and Coil Winding  2008-present
Member of the Board of Directors

PH.D. COMMITTEES IN OTHER UNIVERSITIES
1. Randall Shaffer, University of Dayton, 1999
2. Ian Douglas de Vries, University of Cape Town, South Africa, 1999
3. Samuel Sau-Man Chan, City University of Hong Kong, 2005
4. Leung Ka Sing, City University of Hong Kong, 2005
5. Chin Yat Chung, City University of Hong Kong, 2006
6. Carl Ngai-Man Ho, City University of Hong Kong, 2006
7. Siu Wai Leung, City University of Hong Kong, 2007
8. Song Tingting, City University of Hong Kong, 2007
9. Szymon Pasko, Silesian University of Technology, Poland, 2010
10. P. V. V. Kishore, Andhra University, India, in progress.
PERSONAL

Date of Birth: May 11, 1957
Place of Birth: Poland
Marital Status: Married
Wife's name: Alicja
Children: Anna and Andrew
Status: U.S. and Polish Citizen

REFERENCES

Prof. Jan Ebert
Department of Electronics
Technical University of Warsaw
Nowowiejska 15/19
00-665 Warsaw, POLAND
Office Phone: 011-(48-22)-210-07641

Dr. F. W. Stephenson, Professor
Department of Electrical Engineering
Virginia Polytechnic Inst. & State Univ.
Blacksburg, VA 24061
Office Phone: (703) 961-6560

Dr. David A. de Wolf, Professor
Department of Electrical Engineering
Virginia Polytechnic Inst. & State Univ.
Blacksburg, VA 24061
Office Phone: (703) 961-4874

Dr. John Choma, Jr., Professor
University of Southern California
EE - Electrophysics
Los Angeles, CA 90089-0271
Office Phone: (818) 743-8776

Dr. Robert G. Meyer, Professor
University of California
Dept. of Electrical Engineering & CS
Berkeley, CA 97420
Office Phone: (415) 642-8026

Nathan O. Sokal, President
Design Automation, Inc.
809 Massachusetts Avenue
Lexington, MA 02173
Office Phone: (617) 862-8998

Dr. Frederick H. Raab, President
Green Mountain Radio Research Company
50 Vermont Avenue / Fort Ethan Allen
Vinooski, VT 05404
Office Phone: (802) 655-9670

Dr. Fred C. Lee, Professor
Department of Electrical Engineering
Virginia Polytechnic Inst. & State Univ.
Blacksburg, VA 24061
Office Phone: (703) 961-5787

Dr. I. M. Besieries, Professor
Department of Electrical Engineering
Virginia Polytechnic Inst. & State Univ.
Blacksburg, VA 24061
Office Phone: (703) 961-5787
EDUCATION

<table>
<thead>
<tr>
<th>Degree</th>
<th>Institution</th>
<th>Date</th>
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<tbody>
<tr>
<td>Ph.D.</td>
<td>Wright State University</td>
<td>2008</td>
</tr>
<tr>
<td>M.S.</td>
<td>Wright State University</td>
<td>2001</td>
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<tr>
<td>M.S.</td>
<td>Chinese Academy of Sciences</td>
<td>1988</td>
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<tr>
<td>B. S.</td>
<td>South China University of Technologics</td>
<td>1985</td>
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PROFESSIONAL EXPERIENCE

<table>
<thead>
<tr>
<th>Institution</th>
<th>Position</th>
<th>Dates</th>
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<tbody>
<tr>
<td>Wright State University</td>
<td>Associate Professor</td>
<td>09/2009-present</td>
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<tr>
<td>Wright State University</td>
<td>Visiting Assistant Professor</td>
<td>09/2008-08/2009</td>
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<tr>
<td>Wright State University</td>
<td>Senior Research Associate</td>
<td>03/2001-8/2008</td>
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<tr>
<td>Wright State University</td>
<td>Visiting Scholar</td>
<td>08/1998-02/2001</td>
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<tr>
<td>Shenzhen University</td>
<td>Assistant Professor</td>
<td>03/1993-08/1998</td>
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<tr>
<td>Shenai Semiconductor Co.</td>
<td>Test Engineer</td>
<td>06/1988-03/1993</td>
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PROFESSIONAL MEMBERSHIPS

<table>
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<th>Association</th>
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<tbody>
<tr>
<td>Institute of Electrical &amp; Electronics Engineers (IEEE)</td>
<td>Senior Member</td>
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<td>Phi Kappa Phi</td>
<td>Member</td>
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PROFESSIONAL AWARDS

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<th>Title of Award</th>
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<tr>
<td>Early Career Achievement</td>
<td>College of Engineering and Computer</td>
<td>2014</td>
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<tr>
<td>IEEE Dayton Section Harrell V. Noble Award</td>
<td>IEEE Dayton Section</td>
<td>2012</td>
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<tr>
<td>Excellent Student Advisor Award</td>
<td>Shenzhen City Government</td>
<td>1997</td>
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<tr>
<td>Excellent Teaching Award</td>
<td>Shenzhen University</td>
<td>1994-1997</td>
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<tr>
<td>Second Place Award for Education Research</td>
<td>Shenzhen University</td>
<td>1996</td>
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TEACHING

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<th>Course Taught</th>
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<tr>
<td>EE759</td>
<td>RF CMOS Integrated Circuit Design</td>
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<td>EE758</td>
<td>CMOS Analog Integrated Circuit Design</td>
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<td>EE454/654</td>
<td>VLSI Systems Design</td>
<td>8</td>
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<td>EE459/659</td>
<td>IC Design Synthesis with VHDL</td>
<td>5</td>
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<td>Senior Design</td>
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</table>

- Ph.D. Dissertation Supervised/Supervise
  1. Chris Benedik - Graduation Date: 07/2013
  2. Vinayashree Hiremath - Passed Candidacy Exam
3. Hao Xue 11/2014 passed Candidacy Exam
4. Naga Venkata Vijaya Krishna Boppana
5. Shuo Li
6. Xiaomeng Zhang

- **M.S. Thesis Supervised/Supervise**

- **Graduation Date**

1. Paesol Veerakitti 06/2010
2. Vinayashree Hiremath 11/2010
3. Tri Nygun 03/2011
4. Steven Billman 06/2011
5. Prashanth Muppla 08/2011
6. Lawrence David Burich 08/2012
7. Jian Chen 08/2012
8. Sunny Raj Dommaraju 07/2013 Graduate Student Excellent Award 2014
9. Shuo Li 12/2014
10. Xiaomeng Zhang 12/2014
12. Tyler Moody March 2015 (expected)
13. Joe Strzelecki Summer 2015 (expected)
14. Eswar Raju Suraparaju Fall 2015 (expected)
15. Pushpak Vasanth Rayudu Arja Fall 2015 (expected)
16. Dinesh Varma Penumetcha Summer 2015 (expected)

- **Senior Design Projects**

1. Spring 2013 to Fall 2013, J. Strzelecki, C. Meckstroth, L. Knief, and H. Erwin, “Arbitrary waveform generator design and implementation in 90nm CMOS technology”.

- **Independent Studies Supervised/Supervise**

1. Chris Benedik
2. Kaushik Reddy Katpally
3. Naga Venkata Vijaya Krishna Boppana
4. Eswar Raju Suraparaju
5. Pushpak Vasanth Rayudu Arja
6. Zackary Quach

- **Mentoring Undergraduate Students**

1. Zachary Quach

- **Graduate Student Support**

<table>
<thead>
<tr>
<th>Student Name</th>
<th>GRA Quarters</th>
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<tbody>
<tr>
<td>Paesol Veerakitti</td>
<td>3</td>
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<tr>
<td>Steven Billman</td>
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<tr>
<td>Vinayashree Hiremath</td>
<td>6.3</td>
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<td>Prashanth Muppla</td>
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<td>Dominic Maga</td>
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<td>Jian Chen</td>
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<tr>
<td>Sunny Dommaraju</td>
<td>2/3</td>
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</table>
SCHOLARSHIP

Articles

- **Published and Accepted Refereed Journal Papers**

- **Under Review Refereed Journal Papers**
  2. J. Strzelecki, and **S. Ren**, “Near-zero dead zone phase frequency detector with wide input frequency difference”, *IET Electronics Letters*. (under review)
  3. V. Krishna, and **S. Ren**, "A high speed and low power 64-bit digital comparator in 90nm CMOS technology", *IEEE Trans. on Very Large Scale Integration*. (under review)

- **U. S. Patents**
  1. J. Strzelecki and **S. Ren**, “High performance phase frequency detectors”. (under review)

- **Papers Published in Full and Official Proceedings (R=Refereed)**
  2. V. K. Boppana, **S. Ren**, and H. Chen “Low power and high Speed CPL-CSA adder,” *IEEE National Aero-


6. C. Benedik, and S. Ren, “Passive component stacking to aid power supply decoupling,” *IEEE International Midwest Symposium on Circuits and Systems*, Columbus, OH, August 4-7, 2013. (R)


11. S. Ren, I. Abraham, and R. Siferd, “CMOS analog RF driver operating at 1-10 GHz with 0 dBm output power,” *IEEE Instrumentation and Measurement Technology Conference* (I2MTC 2012), Graz, Austria, May 2012. (R)


21. S. Ren, R. Siferd, Robert Blumgold, and Nima Emami, “Pipelined delta sigma modulator analog to digital converter,” *IEEE Midwest Circuits and Systems Symposium*, San Juan, P.R., August 2006. (R)


25. R. Siferd, S. Ren, T. Grimes, R. Blumgold, C. Cerny, and T. Chang, “100 MHz delta sigma modulator with 4-Bit quantizer in 0.35um CMOS technology,” The 2002 International Multi-conference in Computer Science, VLSI, Las Vegas, Nevada, June 2002. (R)

- **Student Papers in Symposium**

- **Technical Reports**

**Grants Funded** (Total Awarded=$904k; Ren Expenditures=$710k)

<table>
<thead>
<tr>
<th>Title</th>
<th>WSU RSP#</th>
<th>Funding Amount</th>
<th>Duration</th>
<th>Funding Agency</th>
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<th>Co-P.I.s</th>
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<tr>
<td>Low Power Multichannel RF Front End and Digital Anti-jam GPS ASIC</td>
<td>669579</td>
<td>$150k</td>
<td>10/14-10/16</td>
<td>RBS Technologies, LLC</td>
<td>Ren</td>
<td>N/A</td>
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<td>Equipment Enhancement for Nano-tube Sensor Research</td>
<td>667096</td>
<td>$5K</td>
<td>1/12-12/12</td>
<td>LEADER Consortium</td>
<td>Ren</td>
<td>N/A</td>
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<tr>
<td>Deployable Low Power Carbon-Nanotube Sensors</td>
<td>667885</td>
<td>$146K of $200K</td>
<td>12/09-4/11</td>
<td>USAF/AFMC DET 1 AF Research Laboratory</td>
<td>Ren</td>
<td>Zhuang</td>
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<tr>
<td>Digital Synthesizer with Tuning Filter, Phase II</td>
<td>667909</td>
<td>200K</td>
<td>11/09-5/2012</td>
<td>RBS Technologies, LLC</td>
<td>Ren</td>
<td>N/A</td>
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<tr>
<td>Multi Channel RFASIC for Handheld GPS Receiver Anti Jam Enhancement, Pase II</td>
<td>667654</td>
<td>$199,374</td>
<td>4/09-2/12</td>
<td>RBS Technologies, LLC</td>
<td>Ren</td>
<td>N/A</td>
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<tr>
<td>Anti-jam ASIC for Handheld GP</td>
<td>667409</td>
<td>60K of 200K</td>
<td>7/08-2/11</td>
<td>RBS Technologies, LLC</td>
<td>Emmert</td>
<td>Ren</td>
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</table>
### Contributed to the Following WSU Research Contracts (Before my Tenure Track Appointment)


### SERVICE

**Department Committees**

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<th>Department</th>
<th>Position</th>
<th>Dates</th>
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<tr>
<td>Graduate Studies</td>
<td>Member</td>
<td>2009–2011</td>
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<td>Undergraduate Study</td>
<td>Member</td>
<td>2010–now</td>
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<tr>
<td>Laboratory Resources</td>
<td>Member</td>
<td>2012–2014</td>
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<tr>
<td>Faculty search</td>
<td>Member</td>
<td>2014</td>
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<tr>
<td>Chair search</td>
<td>Member</td>
<td>2014</td>
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**Other Committees**

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<th>Committee</th>
<th>Position</th>
<th>Dates</th>
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<tr>
<td>WSU STEMM Organization</td>
<td>Member</td>
<td>2010–now</td>
</tr>
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</table>

**Professional Service**

4. Reviewer, *IEEE Transactions on Circuits and Systems II*
5. Reviewer, *IEEE Transactions on Instrumentation & Measurement*
6. Reviewer, *IEEE Transactions on Semiconductor and Manufacturing*
I. Educational History

Ph.D., Electrical Engineering, The Ohio State University 2003
- *Dissertation: Signal Processing Strategies for Bistatic Synthetic Aperture Radar*

M.S., Electrical Engineering, The Ohio State University 2000
- *Thesis: Physics, Fisher, and Phase: Information Content in SAR Images*

B.S., Physics-Computer Science, University of Dayton 1998

II. Employment History

Academic

Wright State University, Department of Electrical Engineering,
- Department Chair 2014 – present
- Professor 2013 – present
- Associate professor 2009 – 2013
  - Led the response to the ABET site visit in 2011, resulting in a 6-year accreditation for EE
  - Secured a new faculty position (Dr. Michael Saville) in the area of sensor exploitation through external funding and collaboration with Wright State Research Institute
- Director, Sensor Systems Research, Wright State Research Institute 2010 – present
- Assistant professor 2004 – 2009
- Faculty Program Director for Sensors, Wright State Research Institute 2006 – 2009

The Ohio State University, Department of Electrical Engineering, Graduate research assistant 1999 – 2000

University of Michigan, Department of Electrical Engineering, Graduate departmental fellow 1998 – 1999

Industry

SAIC, Reconnaissance & Surveillance Operation, Chief scientist 2009 – 2010
- Provided technical leadership to business development efforts in sensor exploitation

- Defense Research Associates – detection algorithms for visible missile warning
- MacAulay Brown, Inc. – algorithm development for EW applications
- SET Corp. – algorithms for urban GMTI of dismounts
- RBS Technologies – space-time adaptive beam forming algorithms
- Matrix Research & Engineering – algorithms for SAR image formation

Northrop Grumman Electronic Systems, Senior systems engineer 2000 – 2004
- Signal processing team lead for Synthetic Aperture Ladar for Tactical Imaging (SALTI)
- SAR IR&D team lead, topics: auto-focus, speckle-reduction, image formation
- Systems and/or signal processing lead on multiple major proposal efforts
- Synthetic aperture sonar IR&D: image formation

III. Teaching Activities

Graduate courses

EE 861 Adaptive Filters (renewed course offering)
EE 437/637  Modern Signal Processing (new course offering)
EE 763  Classical and Modern Spectral Analysis (renewed course offering)
EE 436/636  Digital Signal Processing
EE 475/675  Introduction to Radar Systems
EE 4360/6360  Digital Signal Processing
EE 4750/6750  Introduction to Radar Systems

**Undergraduate courses**
EE 250  Engineering Problem Solving with MATLAB (renewed course offering)
EE 321  Linear Systems I
EE 322  Linear Systems II
EE 326  Random Signals and Noise
EE 3810  Professional Skills for Electrical Engineers

**Graduate students**

<table>
<thead>
<tr>
<th>Student</th>
<th>Completion Date</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andrew Kondrath</td>
<td>Summer 2006</td>
<td>M.S., Efficient Side Lobe Suppression in Sparse Aperture SAR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supported as GRA spring 2006</td>
</tr>
<tr>
<td>Kelly Feirstine</td>
<td>Summer 2006</td>
<td>M.S., Waveform Diversity Implementation Study</td>
</tr>
<tr>
<td></td>
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<td>Supported as GRA fall 2005 through summer 2006</td>
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<tr>
<td>Jose Montes de Oca</td>
<td>Winter 2007</td>
<td>M.S., System Analysis and RF-Floodlight Exploitation of Short-Range GOTCHA Repeaters</td>
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<td>Supported as GRA summer 2005 through fall 2006</td>
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<tr>
<td>Brian Ore</td>
<td>Winter 2007</td>
<td>M.S., Multilingual Articulatory Features for Speech Recognition</td>
</tr>
<tr>
<td>Jason Blackaby</td>
<td>Spring 2008</td>
<td>M.S., Simultaneous RF/OE Tracking and Characterization of Dismounts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supported as GRA summer 2006 through spring 2008</td>
</tr>
<tr>
<td>Philip Hanna</td>
<td>Spring 2008</td>
<td>Ph.D., Expectation-Maximization Optical Tomosynthetic Volume Imaging</td>
</tr>
<tr>
<td>Ellen Case</td>
<td>Fall 2008</td>
<td>M.S., A Low-Cost Acoustic Array for Detecting and Tracking Multiple Acoustic Targets</td>
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<td></td>
<td>Supported as GRA summer 2007 through fall 2008</td>
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<tr>
<td>Lee Patton</td>
<td>Winter 2007</td>
<td>M.S., A GNU Radio Based Software-Defined Radar</td>
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<td></td>
<td>Spring 2009</td>
<td>Ph.D., On the Satisfaction of Modulus and Ambiguity Function Constraints in Radar Waveform Optimization for Detection</td>
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<td>Supported as RA fall 2005 through fall 2006</td>
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<tr>
<td>Orelle Fogle</td>
<td>Spring 2011</td>
<td>Ph.D., Human Micro-Range/Micro-Doppler Signature Extraction, Association, and Statistical Characterization for High-Resolution Radar</td>
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<tr>
<td></td>
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<td>Supported as GRA summer 2008 through present</td>
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<tr>
<td>Matt Horvath</td>
<td>Winter 2012</td>
<td>M.S., Extensions of Polar Format Scene Size Limits to Squinted Geometries</td>
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<tr>
<td></td>
<td></td>
<td>Supported as GRA fall 2010 through fall 2011</td>
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<tr>
<td>Ryan Fuller</td>
<td>Summer 2012</td>
<td>M.S., Adaptive Noise Reduction Techniques for Airborne Acoustic Sensors</td>
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<tr>
<td>Kristjan Greenewald</td>
<td>Summer 2012</td>
<td>M.S., Prediction of Optimal Bayesian Classification Performance for LADAR ATR</td>
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<tr>
<td>Andrew Lingg</td>
<td>Fall 2008</td>
<td>M.S., An Algorithm for the Detection of Handguns in Terahertz Images</td>
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<tr>
<td></td>
<td>Fall 2012</td>
<td>Ph.D., Statistical Methods for Image Change Detection with Uncertainty</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supported as GRA summer 2007 through fall 2012</td>
</tr>
</tbody>
</table>
Aaron Evers  
Spring 2014  
M.S., Evaluation and Application of LTE, DVB, and DAB  
co-advisor: Prof Julie Jackson (AFIT)  
Cody Lawyer  
Spring 2014  
M.S., Impact of SAR Image Formation Quality on Target Separability  
Matthew Scherreik  
Fall 2014  
M.S., A Probabilistic Technique For Open Set Recognition Using Support Vector Machines  
Aaron Jones  
Fall 2011  
M.S., Frequency Diverse Array Receiver Architectures  
Spring 2015*  
Ph.D., Performance Prediction in Radar Waveform Optimization  
Shaun Frost  
Fall 2011  
M.S., Performance Analysis of Radar Waveforms for Congested Spectrums  
Spring 2015*  
Ph.D., Performance Prediction in Sparse Frequency Waveform Design  
LeRoy Gorham  
Spring 2015*  
Ph.D., Dual Format Algorithm for Synthetic Aperture Imaging  
Anne Zelnio  
Spring 2009  
M.S., Detection of Small Aircraft Using an Acoustic Array  
Spring 2015*  
Ph.D., Dynamic Dictionary Radar Waveform Classification  
Linda Moore  
Fall 2014*  
Ph.D., topic TBD  
Robert Taylor  
Spring 2015*  
Ph.D., topic TBD  

* projected

**Postdoctoral Researchers and Research Scientists**

Orelle Fogle  
June 2011 – present  
Sandeep Gogineni  
November 2012 – present  
Pawan Setlur  
January 2013 – present  

**Thesis/Dissertation committees**

<table>
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<tr>
<th>Student</th>
<th>Completion Date</th>
<th>Degree</th>
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<tbody>
<tr>
<td>Qian Huang</td>
<td>March 2005</td>
<td>M.S., Synchronous DS-CDMA Systems with Minimum-TSC Spreading and Matched-Filter</td>
</tr>
<tr>
<td>Ahmed Nasif</td>
<td>March 2005</td>
<td>M.S., The Capacity of the Gaussian Channel with Scalar, Multidimensional, or Band-limited Binary Input</td>
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<tr>
<td>Karmon Vongsy</td>
<td>July 2007</td>
<td>M.S., Change Detection Methods for Hyperspectral Imagery</td>
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**Scholarly Publications**

**Book Chapters**


**Journal papers**


**Patents**


**Conference papers**


Software

   • Total downloads as of November 2012: 1564
   • Used by Rick Thompson (Northrop Grumman Electronic Systems) in an IR&D project, and acknowledged and cited in the resulting 2012 Tri-Service Radar paper, “Target matched illumination and signature behaviors.”
   • Used by Mark Richards and Daniel Campbell (GTRI) in DARPA's Polymorphous Computing Architectures program, and discussed and cited in their 2009 final report, “Programming Methodology for High Performance Applications on Tiled Architectures.”

Invited presentations


V. Professional Service and Membership

Professional organizations

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<tr>
<th>Organization</th>
<th>Professional role</th>
<th>Year</th>
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<tr>
<td>IEEE ABET</td>
<td>Prog. Evaluator</td>
<td>2013–present</td>
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<tr>
<td></td>
<td>Evaluated Drexel University BS in Electrical Engineering program</td>
<td>2013</td>
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<tr>
<td></td>
<td>Evaluated University of Central Florida BS in Electrical Engineering program</td>
<td>2014</td>
</tr>
<tr>
<td>IEEE Signal Processing Society</td>
<td>Senior Member</td>
<td>2000–present</td>
</tr>
<tr>
<td>IEEE Aerospace and Electronic Systems Society</td>
<td>Senior Member</td>
<td>2000–present</td>
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<tr>
<td>IEEE Radar Systems Panel</td>
<td>Member</td>
<td>2009–present</td>
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<tr>
<td>IEEE Ultra-Wideband Radar Committee</td>
<td>Member</td>
<td>2011–present</td>
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<tr>
<td>IEEE Aerospace and Electronic Systems Magazine</td>
<td>Guest Editor</td>
<td>2012–2013</td>
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<tr>
<td></td>
<td>Special issue on Wide-Area and Staring Synthetic Aperture Radar – published January 2014</td>
<td></td>
</tr>
<tr>
<td>IEEE Radar Conference</td>
<td>Publications Chair</td>
<td>2011</td>
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<tr>
<td></td>
<td>General Chair</td>
<td>2014</td>
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<td></td>
<td>Past Chair</td>
<td>2015</td>
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<tr>
<td>IEEE Conf. on Microwaves, Comm, Antennas &amp; Electronic Systems</td>
<td>Tech Committee</td>
<td>2013</td>
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<td>IEEE Forum for Leading Researchers</td>
<td>Invited Attendee</td>
<td>2013</td>
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<tr>
<td>IEEE Transactions on Image Processing</td>
<td>Reviewer</td>
<td>2004–present</td>
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<td>IEEE Transactions on Signal Processing</td>
<td>Reviewer</td>
<td>2004–present</td>
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<tr>
<td>IEEE Transactions on Aerospace and Electronic Systems</td>
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<td>IET Radar, Sonar, &amp; Navigation</td>
<td>Reviewer</td>
<td>2006–present</td>
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<tr>
<td>IET Signal Processing</td>
<td>Reviewer</td>
<td>2007–present</td>
</tr>
<tr>
<td>International Conference on Information Fusion</td>
<td>Reviewer</td>
<td>2005</td>
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<td>Army Research Lab – Proposals</td>
<td>Reviewer</td>
<td>2006</td>
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<tr>
<td>Elsevier Signal Processing</td>
<td>Reviewer</td>
<td>2007</td>
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<tr>
<td>2nd International Workshop on Collaborative Trusted Sensing</td>
<td>Tech Committee</td>
<td>2010</td>
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National Research Council of the National Academy of Sciences
Review of Specialized Degree-Granting Graduate Programs of the
Department of Defense in Science, Technology, Engineering,
Mathematics and Management
Invited Panelist 2013
3rd International Workshop on Compressed Sensing Theory
and its Applications to Radar, Sonar and Remote Sensing
Tech Committee 2015
NAECON/OIS Planning Board 2015

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<th>Academic committees</th>
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<th>Role</th>
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<tr>
<td>Academic Computing</td>
<td>College of Engineering</td>
<td>Member</td>
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<td>DSP/Wireless</td>
<td>Department of Electrical Engineering</td>
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<td>Academic Computing</td>
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<td>DSP/Wireless</td>
<td>Department of Electrical Engineering</td>
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<td>EE Undergraduate Studies</td>
<td>Department of Electrical Engineering</td>
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<td>2006–2007</td>
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<td>Laboratory Resources</td>
<td>Department of Electrical Engineering</td>
<td>Member</td>
<td>2006–2007</td>
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<tr>
<td>Academic Honesty</td>
<td>College of Engineering</td>
<td>Member</td>
<td>2007–2008</td>
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<tr>
<td>SSIP Focus Area</td>
<td>College of Engineering Ph.D.</td>
<td>Chair</td>
<td>2007–2008</td>
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<tr>
<td>University Technology</td>
<td>University</td>
<td>Member</td>
<td>2007–2008</td>
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<td>Acad. Integrity Hearing Panel</td>
<td>University</td>
<td>Member</td>
<td>2007–2008</td>
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<td>DSP/Wireless</td>
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<td>Ad Hoc: Department Bylaws</td>
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<td>2008–2009</td>
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<td>Strategic Planning</td>
<td>Department of Electrical Engineering</td>
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<td>2008–2009</td>
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<td>Eminent ORS Search</td>
<td>Department of Electrical Engineering</td>
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<td>2008–2009</td>
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<td>Curriculum</td>
<td>College of Engineering</td>
<td>Member</td>
<td>2008–2009</td>
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<tr>
<td>Academic Integrity Advisory</td>
<td>College of Engineering</td>
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<td>2008–2009</td>
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<td>Chair</td>
<td>2008–2009</td>
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<td>University</td>
<td>Chair</td>
<td>2008–2009</td>
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<td>Undergraduate Studies</td>
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<td>2009–2010</td>
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<td>Department Bylaws</td>
<td>Department of Electrical Engineering</td>
<td>Member</td>
<td>2009–2010</td>
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<td>Department of Electrical Engineering</td>
<td>Member</td>
<td>2009–2010</td>
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<td>Faculty Development</td>
<td>Department of Electrical Engineering</td>
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<td>2009–2010</td>
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<td>Member</td>
<td>2009–2010</td>
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<td>2009–2010</td>
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<td>2009–2010</td>
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<td>2011–2012</td>
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<td>2011–2012</td>
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<td>2011–2012</td>
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<td>Member</td>
<td>2011–2012</td>
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<td>University</td>
<td>Member</td>
<td>2011–2012</td>
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<td>Research Integrity Inq. Comm.</td>
<td>University</td>
<td>Member</td>
<td>2011–2012</td>
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</tbody>
</table>
Undergraduate Studies
Department of Electrical Engineering
Director 2012–2013

Faculty search
Department of Electrical Engineering
Chair 2012–2013

- Created position through (50/50) cost share between research funds and WSRI for the first 3 years

Curriculum
College of Engineering
Member 2012–2013

Program Affairs
College of Engineering Ph.D.
Member 2012–2013

Appeals Panel
University
Member 2012–2013

Research Integrity Inv. Comm.
University
Chair 2012–2013

Graduate Council
University
Member 2012–2013

Undergraduate Studies
Department of Electrical Engineering
Director 2013–2014

Curriculum
College of Engineering
Member 2013–2014

Program Affairs
College of Engineering Ph.D.
Member 2013–2014

Appeals Panel
University
Member 2013–2014

Faculty Budget Priority
University
Member 2013–2014

Graduate Council
University
Member 2013–2014

Intern'l Programs Oversight
University
Chair 2013–2014

Undergraduate Student Success
University
Member 2013-2014

Graduate Council
University
Member 2014–2015

VI. External Contracts and Grants (principle and sole investigator on all awards except as noted)

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Sponsor</th>
<th>Dates</th>
<th>Amount</th>
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<tr>
<td>SALTI System Engineering Support</td>
<td>NGC (DARPA)</td>
<td>Jul-04 to Jun-05</td>
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<tr>
<td>Operational Analysis of Simulated Urban RFID Data</td>
<td>AlphaTech (DARPA)</td>
<td>Aug-04 to Feb-05</td>
<td>$35,000</td>
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<tr>
<td>System Analysis and RF-Floodlight Exploitation of Short-Range GOTCHA Repeaters</td>
<td>AFRL/SNA</td>
<td>Jun-05 to Jan-08</td>
<td>$146,462</td>
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<tr>
<td>System Analysis and RF-Floodlight Exploitation of Short-Range GOTCHA Repeaters</td>
<td>Anteon (AFRL/SNA)</td>
<td>Jun-05 to Sep-07</td>
<td>$68,681</td>
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<tr>
<td>Waveform Diversity Implementation Study</td>
<td>ATK-MR (AFRL/SNR)</td>
<td>Oct-05 to Mar-07</td>
<td>$100,000</td>
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<tr>
<td>Staring Mode Airborne Radar Techniques</td>
<td>SET Assoc. (DARPA)</td>
<td>Jan-06 to Sep-06</td>
<td>$50,000</td>
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<tr>
<td>All-Weather Feature-Based Combat ID</td>
<td>SET Corp. (AFRL/SNA)</td>
<td>Jul-06 to Apr-08</td>
<td>$100,000</td>
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<tr>
<td>Multi-Sensor/Multi-Modal Sensor Development and Algorithm Research for Urban Vigilance</td>
<td>WBI (AFRL/SNA)</td>
<td>Aug-06 to Mar-08</td>
<td>$416,500</td>
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<td>Co-investigators: B. Rigling (PI), L. Hong, A. Shaw, F. Garber</td>
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<tr>
<td>Software-Defined Radio for Robust and Low-Cost Detection of Electronic Emitters</td>
<td>MacAulay-Brown (AFRL/SNR)</td>
<td>Apr-07 to Jul-07</td>
<td>$10,000</td>
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<tr>
<td>Co-investigators: B. Rigling (PI), Z. Wu</td>
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<tr>
<td>Noncoherent Dual Platform AMC Jammer</td>
<td>RBS Technologies (AFRL/SNR)</td>
<td>Jun-07 to Mar-08</td>
<td>$33,000</td>
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<td>Co-investigators: Z. Wu (PI), B. Rigling</td>
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<tr>
<td>Dismount GMTI Technology for Urban Operations</td>
<td>SET Corp. (AFRL/SNR)</td>
<td>Jun-07 to Mar-08</td>
<td>$16,666</td>
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<td>Institute for the Development and Commercialization of Advanced Sensor Technology (IDCAST)</td>
<td>University of Dayton (Ohio 3rd Frontier)</td>
<td>Feb-07 to Feb-10</td>
<td>$699,486</td>
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<tr>
<td>Co-investigators: D. Petkie (PI), L. Lew Yan Voon, B. Rigling, L. Hong, A. Shaw</td>
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<tr>
<td>Center for ATR – IDIQ Contract</td>
<td>Ohio State University (AFRL/RYA)</td>
<td>Jul-07 to Oct-08</td>
<td>$199,805</td>
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<tr>
<td>Center for ATR – Research Infrastructure</td>
<td>Ohio State University (AFRL/RYA)</td>
<td>Sep-07 to Oct-09</td>
<td>$85,321</td>
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<td>Modeling, Simulation and Analysis Technologies</td>
<td>SAIC (AFRL/RYA)</td>
<td>Mar-08 to Nov-08</td>
<td>$33,579</td>
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<td>Center for ATR – Task Order 004</td>
<td>Ohio State University (AFRL/RYA)</td>
<td>May-08 to Mar-09</td>
<td>$308,000</td>
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Co-investigators: B. Rigling (PI), L. Hong, D. Petkie, K. Rattan
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<th>Project Description</th>
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<td>NASIC DSP Training</td>
<td>NASIC</td>
<td>Jun-08 to Dec-08</td>
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<td>Center for ATR – Summer Intern Program</td>
<td>Ohio State University (AFRL/RYA)</td>
<td>Sep-07 to Oct-08</td>
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<td>Applied Optimization Technical Support</td>
<td>Applied Optimization (AFRL/RYRT)</td>
<td>Aug-08 to May-09</td>
<td>$13,178</td>
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<td>RemSense, Inc. Phase I SBIR Sensor Technology</td>
<td>RemSense, Inc. (AFRL/RYRT)</td>
<td>Jan-09 to Oct-09</td>
<td>$14,766</td>
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<tr>
<td>Academic Pipeline and Futures Lab</td>
<td>Ohio State University (AFRL/RYA)</td>
<td>Jun-09 to Jun-14</td>
<td>$690,000</td>
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<td><strong>Co-investigators:</strong> D. Petkie (PI), K. Rattan, S. Ren, B. Rigling, J. Skipper, K. Xue, A. Shaw, K-L Chu, Y. Zhuang</td>
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<td>Collaborative Research: Planning Grant: I/UCRC for Surveillance Theory</td>
<td>NSF</td>
<td>Aug-09 to Jul-10</td>
<td>$10,000</td>
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<td>Collaborative Center for Surveillance Research</td>
<td>Membership fees (AFRL/RYR)</td>
<td>Mar-10 to Jun-11</td>
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<td>Cognitive Radio Co-Existence Analysis and Interference Impact Study</td>
<td>MacAulay-Brown (AFRL/RYA)</td>
<td>Mar-10 to Jun-11</td>
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<td>Center for ATR – CY2010</td>
<td>Ohio State University (AFRL/RYA)</td>
<td>Mar-10 to Jun-11</td>
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<td><strong>Co-investigators:</strong> B. Rigling (PI), F. Garber</td>
<td>Membership fees (AFRL/RYA)</td>
<td>Mar-10 to Jun-11</td>
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<tr>
<td>Application of Range Doppler Processing</td>
<td>Matrix Research &amp; Eng. (AFRL/RYA)</td>
<td>Mar-11 to Jul-11</td>
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<tr>
<td>Revolutionary Intelligence and Influence Tech. (RIIT)</td>
<td>AFRL/RH</td>
<td>May-11 to Apr-12</td>
<td>$100,000</td>
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<td>Center for ATR – Summer 2011</td>
<td>Ohio State University (AFRL/RYA)</td>
<td>Jul-10 to Dec-11</td>
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<td><strong>Co-investigators:</strong> B. Rigling (PI), F. Garber</td>
<td>AFRL/RYA</td>
<td>Jul-10 to Dec-12</td>
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<td>Center for ATR – Summer 2011 thru CY2012</td>
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<td>Jul-10 to Jun-14</td>
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<td>Image Truthing of WAMI Data Sets</td>
<td>AFRL/RYA</td>
<td>Jul-10 to Jun-14</td>
<td>$154,000</td>
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<td>Collaborative Center for Surveillance Research</td>
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<td><strong>Co-investigators:</strong> B. Rigling (PI), F. Garber</td>
<td>Matrix Research &amp; Eng. (AFRL/RYA)</td>
<td>May-12 to Dec-13</td>
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<td>Algorithms for dismount Detection in Synthetic Aperture Radar</td>
<td>SSCI</td>
<td>Jun-12 to Jan-13</td>
<td>$30,000</td>
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<td><strong>Co-investigators:</strong> B. Rigling (PI), R. Fogle</td>
<td>(Navy STTR)</td>
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<tr>
<td>Wide-Area Motion Imagery and Radio Frequency Compressive Sensing Applications</td>
<td>SSCI</td>
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<td><strong>Co-investigators:</strong> B. Rigling (PI), R. Fogle</td>
<td>(AFRL/RYA)</td>
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<td>Passive Multistatic Radar</td>
<td>Matrix Research &amp; Eng. (AFRL/RYA)</td>
<td>May-12 to Dec-12</td>
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<td>Layered Sensing Student Research</td>
<td>AFRL/RYA</td>
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<td>HAPSITE ER Volatile Signature Reception</td>
<td>Henry Jackson Found. (AFRL/RH 711th HPW)</td>
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<td>**Co-inv.: M. Rizki (PI), F. Garber, B.Rigling</td>
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<td>Object Physics for Exploit. &amp; Recog. Adv. (OPERA)</td>
<td>SAIC (AFRL/RYA)</td>
<td>Sep-13 to Feb-15</td>
<td>$74,993</td>
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<td>Fiorano Virtual Test Track</td>
<td>Ohio Supercomputer Ctr.</td>
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<tr>
<td><strong>Co-investigator:</strong> B. Rigling (PI), T. Rovito (AFRL)</td>
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<td>AFRL Research Collaboration Program</td>
<td>AFRL/RYA</td>
<td>Feb-14 to Jun-17</td>
<td>$1,083,504</td>
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<td>ATRC Summer Program</td>
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<td><strong>Co-investigator:</strong> B. Rigling (PI), F. Garber</td>
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<tr>
<td>Collaborative Center for Surveillance Research</td>
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<td>AFRL/RYA</td>
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<td>Project Description</td>
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<td>FAR Team Postdoctoral Researchers</td>
<td>AFRL/RYA</td>
<td>Feb-14 to Jun-17</td>
<td>$382,534</td>
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<td>Gotcha HPC Tools</td>
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<td>Feb-14 to Jun-17</td>
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<td>AFRL Research Collaboration Program</td>
<td>AFRL/RYA</td>
<td>Feb-14 to Jun-17</td>
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<td>AFRL RCP Image Truthing</td>
<td>AFRL/RYA</td>
<td>Feb-14 to Jun-17</td>
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<td>Cooperative RF Sensors</td>
<td>Matrix Research (AFRL/RW)</td>
<td>Jul-14 to Mar-15</td>
<td>$15,000</td>
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<tr>
<td>Robust Adaptive Sensing Research</td>
<td>Defense Eng. Corp. (AFRL/RYM)</td>
<td>Aug-14 to Aug-15</td>
<td>$47,499</td>
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<tr>
<td>Co-inv.: R. Fogle (PI), B. Rigling</td>
<td>HPTi</td>
<td>Nov-14 to Aug-15</td>
<td>$17,344</td>
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<tr>
<td>Parallel Synthetic Aperture Acoustic</td>
<td>HPTi</td>
<td>Nov-14 to Aug-15</td>
<td>$17,344</td>
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<tr>
<td>Co-inv.: B. Rigling (PI), D. Short</td>
<td>HPTi</td>
<td>Nov-14 to Aug-15</td>
<td>$14,253</td>
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<tr>
<td>Utilization of Hybrid Computing</td>
<td>HPTi</td>
<td>Nov-14 to Aug-15</td>
<td>$14,253</td>
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<tr>
<td>Co-inv.: B. Rigling (PI), D. Short</td>
<td>HPTi</td>
<td>Nov-14 to Aug-15</td>
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<td>Collaborative Center for Surveillance Research</td>
<td>Membership fees</td>
<td>Jul-10 to Jan-16</td>
<td>$110,000</td>
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**VII. Awards and Professional Recognition**

- 2013-2014 Faculty Excellence in Research Award, College of Engineering and Computer Science
- 2012-2013 Outstanding Faculty Member, College of Engineering and Computer Science, nominated for Trustees' Award for Faculty Excellence
- 2011-2012 College of Engineering and Computer Science nominee for the Brage Golding Distinguished Professor of Research Award
- 2009-2010 College of Engineering and Computer Science nominee for the Brage Golding Distinguished Professor of Research Award
- 2007-2008 Faculty Excellence in Research Award, College of Engineering and Computer Science
- 2006 Research and Sponsored Programs Annual Report, featured faculty member for the 2000s
- 2005-2006 Nominee for the Excellence in Teaching Award for Faculty, College of Engineering and Computer Science
Michael A. Saville, Ph.D., P.E.

Department of Electrical Engineering
Wright State University
422 Russ Engineering Center
3640 Colonel Glenn Highway
Dayton, OH 45435

(937) 775-5169
michael.saville@wright.edu
http://www.cs.wright.edu/msaville/
Citizenship: USA
DoD clearance date: 2011

I. EDUCATION

Ph.D., Electrical Engineering, University of Illinois at Urbana-Champaign 2006
  ● Dissertation: Multilevel Multipole-Free Fast Algorithm for Electromagnetic Scattering Problems in Layered Media
M.S.E.E. Air Force Institute of Technology (AFIT) 2000
  ● Thesis: Investigation of Conformal High-Impedance Ground Planes
B.S.E.E., Texas A&M University, Magna Cum Laude (University Fellow & Honors Citation) 1997

II. PROFESSIONAL EXPERIENCE

Academic
Wright State University, Department of Electrical Engineering, Assistant professor 2012 – present
Air Force Institute of Technology, Department of Electrical Engineering, Assistant professor 2006 – 2011

Government
Sensors Directorate, Air Force Research Lab, Senior Research Engineer, 2011 – 2012
  ● Radar-based electromagnetic phenomenology for layered sensing
  ● Laboratory radar experimentation in semi-controlled environment
  ● Full-wave modeling and simulation of electromagnetic scattering by complex targets
  ● Deputy Chair, EE Division Chief, Department of Electrical and Computer Engineering, AFIT
  ● Section Chief, supervised 20-member team of electronic warfare engineers, analysts and technicians
  ● Electronic warfare systems analyst, calibration technician, radar maintenance specialist

III. ACADEMIC AWARDS

  ● 2015 Nominee for the Presidential Early Career Award for Faculty Excellence, College of Engineering and Computer Science, Wright State University
  ● 2014 Nominee for the Excellence in Teaching Award for Faculty, College of Engineering and Computer Science, Wright State University
  ● 2011 SOCHE Excellence in Teaching Award, Air Force Institute of Technology

IV. TEACHING

WSU Graduate courses
EE 7470 Electromagnetics Simulation Methods (renewed course offering)
EE 7640 Advanced Electromagnetics Engineering (new course offering)
EE 7330 Modern Radar Theory (renewed course offering)
EE 4000/6000 Linear Systems II

AFIT Graduate courses
EENG 509 Fundamentals of Electronic Warfare (new course offering)
EENG 535 Radar Systems Analysis
EENG 622  Advanced Electromagnetics I  
EENG 634  Methods in Computational Electromagnetics  
EENG 668  Advanced Radar Systems Analysis  
EENG 678  Adaptive Clutter Suppression  
EENG 714  Advanced Topics in Radar Applications (new course offering)

**Undergraduate courses**

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<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>EE 3450</td>
<td>Fundamentals of Electromagnetics</td>
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<td>EE 3450/L</td>
<td>Electromagnetics Lab</td>
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**Graduate students**

<table>
<thead>
<tr>
<th>Student</th>
<th>Completion Date</th>
<th>Degree</th>
<th>Thesis Title</th>
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<tbody>
<tr>
<td>Oscar Mayhew</td>
<td>Summer 2007 (AFIT)</td>
<td>M.S.E.E., Radar System Characterization Extended to Hardware-in-the-Loop Simulation for the Lab-Vol System</td>
<td></td>
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<tr>
<td>Soner Ozer</td>
<td>Spring 2008 (AFIT)</td>
<td>M.S., Increasing Combat Aircraft Survivability Through Coherent Self-Protection Jammers</td>
<td></td>
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<tr>
<td>James Townsend</td>
<td>Spring 2008 (AFIT)</td>
<td>M.S.E.E., Improvement of ECM Techniques through Implementation of a Genetic Algorithm</td>
<td></td>
</tr>
<tr>
<td>Jawad Farooq</td>
<td>Spring 2009 (AFIT)</td>
<td>Ph.D., Frequency Diversity for Improving Synthetic Aperture Radar Imaging</td>
<td></td>
</tr>
<tr>
<td>James Weber</td>
<td>Spring 2009 (AFIT)</td>
<td>M.S.E.E., Modeling of DRFM Waveforms for Classification and Identification of Input Signals</td>
<td></td>
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<tr>
<td>Nicholas Amato</td>
<td>Spring 2009 (AFIT)</td>
<td>M.S.E.E., Modeling and Simulation Architecture for Studying Doppler-Based Radar with Complex Environments</td>
<td></td>
</tr>
<tr>
<td>Manuel Arriagada</td>
<td>Spring 2010 (AFIT)</td>
<td>M.S., Performance of Scattering Matrix Decomposition and Color Spaces for Synthetic Aperture Radar Imagery</td>
<td></td>
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<tr>
<td>Lester Long</td>
<td>Spring 2010 (AFIT)</td>
<td>M.S.E.E., An Approach to Large Scale Radar-Based Modeling and Simulation</td>
<td></td>
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<tr>
<td>Steven Brady</td>
<td>Spring 2010 (AFIT)</td>
<td>M.S.E.E. (Distinguished Graduate), Frequency Diverse Array Radar: Signal Characterization and Measurement Accuracy</td>
<td></td>
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<tr>
<td>Steven Sutara</td>
<td>Spring 2011 (AFIT)</td>
<td>M.S.E.E., Experimental Investigation into the Radar Cross Section of the Gridded Square Trihedral</td>
<td></td>
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<tr>
<td>Dane F. Fuller</td>
<td>Summer 2011 (AFIT)</td>
<td>Ph.D., Phase History Decomposition for Efficient Scatterer Classification in SAR Imagery</td>
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<tr>
<td>Justin Farmer</td>
<td>Summer 2014</td>
<td>M.S., Pixel Qualification Methods in Attributed Scattering Center Extraction</td>
<td></td>
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<tr>
<td>Jason Brand</td>
<td>Fall 2014</td>
<td>M.S., Biaxial Material Design Method for the Reduced Aperture Waveguide Model</td>
<td></td>
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<tr>
<td>Ryan Shaver</td>
<td>Spring 2015*</td>
<td>M.S., A Modeling Approach for the transition waveguide</td>
<td></td>
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<tr>
<td>Joshua Compaleo</td>
<td>Summer 2015*</td>
<td>M.S., topic TBD</td>
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<tr>
<td>Erin Best</td>
<td>Fall 2016*</td>
<td>M.S., topic TBD</td>
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* projected
Thesis/Dissertation committees

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<th>Completion Date</th>
<th>Degree</th>
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<tr>
<td>Matt Holston</td>
<td>Mar. 2007</td>
<td>M.S.E.E</td>
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<tr>
<td>Uttam Majumder</td>
<td>Mar. 2007</td>
<td>M.S.</td>
</tr>
<tr>
<td>Murat Dogrul</td>
<td>Mar. 2008</td>
<td>M.S.</td>
</tr>
<tr>
<td>Brian Donnel</td>
<td>Mar. 2008</td>
<td>M.S.E.E.</td>
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<tr>
<td>Paul Brand</td>
<td>Mar. 2008</td>
<td>M.S.E.E.</td>
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<tr>
<td>William Keichel</td>
<td>Mar. 2009</td>
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<tr>
<td>Adam Schultz</td>
<td>Mar. 2009</td>
<td>M.S.E.E.</td>
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<tr>
<td>William Gunn</td>
<td>Mar. 2010</td>
<td>M.S.E.E.</td>
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<tr>
<td>Chris Allen</td>
<td>Ma. 2010</td>
<td>M.S.E.E.</td>
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<tr>
<td>Matt Nelms</td>
<td>Mar. 2010</td>
<td>M.S.E.E.</td>
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<tr>
<td>Stephen Moon</td>
<td>Mar. 2011</td>
<td>M.S.E.E.</td>
</tr>
<tr>
<td>Matt Olney</td>
<td>Mar. 2011</td>
<td>M.S.E.E.</td>
</tr>
<tr>
<td>Cody Lawyer</td>
<td>May 2014</td>
<td>M.S.</td>
</tr>
<tr>
<td>Ryan Hamilton</td>
<td>Jul. 2014</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Kumar Daram</td>
<td>Aug. 2014</td>
<td>M.S.</td>
</tr>
<tr>
<td>Sourav Dey</td>
<td>Aug. 2014</td>
<td>M.S.</td>
</tr>
<tr>
<td>Ali Karbasi</td>
<td>Nov. 2014</td>
<td>M.S.</td>
</tr>
<tr>
<td>Alex Compton</td>
<td>Jan. 2015</td>
<td>M.S.</td>
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V. SCHOLARSHIP

Journal papers


CV (Saville) 3 of 6
Conference papers


Invited presentations


Grants Funded

<table>
<thead>
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<th>Project Title</th>
<th>Sponsor:</th>
<th>Dates:</th>
<th>Amount:</th>
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<tr>
<td>Algorithms for Dismount Detection in Synthetic Aperture Radar</td>
<td>Matrix Research</td>
<td>May-12 to Dec-13</td>
<td>$75,848</td>
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<td>Transformational Optics Design of Antenna Feasibility Study on Radar Exploitation (REX) Using Compact Feature Extraction</td>
<td>AFRL/RYMH</td>
<td>Jan-13 to Dec-13</td>
<td>$30,000</td>
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<tr>
<td>Transformation Optics Design of Antennas and Complex Electromagnetic structures</td>
<td>Etegent (AFRL/RYM)</td>
<td>Sep-13 to May-14</td>
<td>$20,000</td>
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<td>S4 (AFRL/RYMH)</td>
<td>Jan-14 to Oct-14</td>
<td>$30,000</td>
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CV (Saville) 5 of 6
Phase Noise Effects on SAR AFRL/RYAP May-14 to Aug-15 $56,000
Complex Electromagnetic structures

Signatures Phenomenology and Measurement AFRL/RYAP submitted Sep 14 $90,000
Test Bench

Synthetic Aperture Image Formation from DLA (DARPA) submitted May 15 $502,570
CAD Models

Clutter Modeling for Ray Tracing Methods Riverside Research submitted May 15 $31,500
(AFRL/RYMH)

VI. SERVICE

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<th>Professional organizations</th>
<th>Role</th>
<th>Year</th>
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<tr>
<td>IET Radar, Sonar, &amp; Navigation</td>
<td>Reviewer</td>
<td>2006–present</td>
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<tr>
<td>AGU Radio Science</td>
<td>Reviewer</td>
<td>2007–present</td>
</tr>
<tr>
<td>IEEE Antenna and Propagation Society Meeting</td>
<td>Reviewer</td>
<td>2008–present</td>
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<tr>
<td>IEEE Radar Conference</td>
<td>Reviewer</td>
<td>2009–present</td>
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<tr>
<td>IEEE Transactions on Aerospace and Electronic Systems</td>
<td>Reviewer</td>
<td>2010–present</td>
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<tr>
<td>IEEE Transactions on Geoscience and Remote Sensing</td>
<td>Reviewer</td>
<td>2011–present</td>
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<tr>
<td>IEEE Antennas and Wireless Propagation Letters</td>
<td>Reviewer</td>
<td>2011–present</td>
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<tr>
<td>Progress in Electromagnetics Research Society (PIERS)</td>
<td>Assoc. Editor</td>
<td>2012–present</td>
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<th>Role</th>
<th>Year</th>
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<tbody>
<tr>
<td>HLC Report</td>
<td>AFIT</td>
<td>Member</td>
<td>2009-2010</td>
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<tr>
<td>Administration</td>
<td>Electrical Engineering Division (AFIT)</td>
<td>Chief</td>
<td>2009-2010</td>
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<tr>
<td>Administration</td>
<td>Department of Electrical and Computer Engineering (AFIT)</td>
<td>Deputy Chair</td>
<td>2010-2011</td>
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<tr>
<td>Civilian Student Working Group</td>
<td>College of Engineering and Management (AFIT)</td>
<td>Member</td>
<td>2010-2011</td>
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<tr>
<td>Faculty Search</td>
<td>Department of Electrical Engineering</td>
<td>Member</td>
<td>2014–present</td>
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<tr>
<td>Scholarship</td>
<td>College of Engineering and Computer Science</td>
<td>Member</td>
<td>2015–present</td>
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</table>
# CURRICULUM VITAE

Arnab K. Shaw  
Department of Electrical Engineering  
Wright State University  
Dayton OH 45435  
Phone: (937)-775-5064; Email: ashaw@wright.edu

Citizenship Status: Citizen of USA  
Marital Status: Married with 2 Children

## EDUCATION

<table>
<thead>
<tr>
<th>Institution</th>
<th>Concentration</th>
<th>Degree/Date</th>
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<tbody>
<tr>
<td>University of Rhode Island, Rhode Island</td>
<td>Electrical Engineering</td>
<td>Ph.D. 1987</td>
</tr>
<tr>
<td>Villanova University, Pennsylvania</td>
<td>Electrical Engineering</td>
<td>M.S. 1983</td>
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<tr>
<td>Jadavpur University, Calcutta, India</td>
<td>Electrical Engineering</td>
<td>B.E. 1979</td>
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## ACADEMIC EXPERIENCE

<table>
<thead>
<tr>
<th>Institution</th>
<th>Position</th>
<th>Dates</th>
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<tbody>
<tr>
<td>Wright State University</td>
<td>Professor</td>
<td>Fall-2000-</td>
</tr>
<tr>
<td>Wright State University</td>
<td>Associate Professor</td>
<td>1994-2000</td>
</tr>
<tr>
<td>Wright State University</td>
<td>Assistant Professor</td>
<td>1987-1994</td>
</tr>
<tr>
<td>University of Rhode Island</td>
<td>Research Fellow</td>
<td>1984-1987</td>
</tr>
<tr>
<td>Southern Methodist University</td>
<td>Teaching Assistant</td>
<td>1983</td>
</tr>
<tr>
<td>Villanova University</td>
<td>Teaching Assistant</td>
<td>1982-1983</td>
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## OTHER PROFESSIONAL EXPERIENCE

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PROFESSIONAL MEMBERSHIP

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AWARDS

2006          Chief Scientist’s Award, The Sensor’s Directorate, AFRL, WPAFB, Dayton, OH. (For the work on Cognitive Radio in collaboration with Vasu Chakravarty and James Stephens)

1993-1994      Excellence in Research, College of Engineering and Computer Science, Wright State University

1984-1987      Transcom Research Fellowship, for pursuing Ph.D. studies at University of Rhode Island

LIST OF COURSES TAUGHT

UNDERGRADUATE LEVEL

EE 303/503   Circuit Analysis II
EE 304/504   Circuit Analysis II (Lab)
EE 331/531   Electronic Devices I
EE 332/532   Electronic Devices I (Lab)
EE 321/521   Linear Systems I
EE 322/522   Linear Systems II
EE 326/526   Random Signals and Noise
EE 421/621   Communication Theory
EE 435/635   Analog and Digital Filter Design
EE 473/673   Communication Systems Design I
EE 480/680   Probability Theory for Electrical Engineers

GRADUATE LEVEL

EE 701        Linear Systems
EE 7150       Digital Image Processing
EE 735        Wireless Communication Techniques
EE 736        Advanced Wireless Communication Techniques
EE 761        Analytical Techniques of Stochastic Analysis
EE 762        Detection, Estimation, and Optimal Filter Theory
EE 763        Classical and Modern Spectral Analysis
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<th>Journal Articles</th>
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**PAPERS PUBLISHED IN FULL IN OFFICIAL PROCEEDINGS**


57. Misra, P. and Shaw, A. K., “2-D State-space Filters with Reduced Number of Multipliers,”


**GRANTS AND CONTRACTS**

**Total External Funding = $1,614,986**

1. Principal Investigator, Shaw, A. K., Hierarchical Classification of Vibrometry Data with
   Decision Level Fusion using Synthetic Aperture Radar, WSU Grant# - ??, NSF Center for
   Scientific Research, OSU-WSU.  
   (Aug-14 to Aug-15, $44,000)

2. Principal Investigator, Shaw, A. K., Techniques of Unitary Transform and Modal Mutual
   Information, WSU Grant# - 668809, AFRL.  
   (Mar-13 to Mar-15, $111,680)

3. Principal Investigator, Shaw, A. K., Separability and Stability Analysis of Laser Vibrometry
   Signals, & Ladar Techniques and Research. WSU Proposal# 13-095-10/13-0292-02 WSU
   Grant# - 668947/669477, AFRL (via LEIDOS/SAIC Subcontract).  
   (Sep-12 to May-16, $242,624)

   for use by Ground Force Troops, WSU Proposal# 12-592-14. WSU Grant# - 668789,
   AFRL Student Challenge, Ohio Aerospace Institute.  
   (Jan-12 to June-12, $5082)

5. PI, Shaw, A. K., Urban Vigilance Using Layered Sensing, WSU# 08-383-10. SBIR Phase II,
   Gitam Technologies, Inc.  
   (May-08 to Jan-11, $135,625)

6. Principal Investigator, Shaw, A. K., Characterization of Hyperspectral Images for Automated
   Target Detection and Recognition, AFRL, RASER BAA: 04-03-SNK  
   (Jul-05 to Nov-08, $261,855)

7. Principal Investigator, Shaw, A. K., Analysis and Characterization of Hyperspectral Images
   in Urban Combat, DARPA/AFRL via Alphatech Corporation.  
   (Aug-04 to Feb-05, $40,000)

**Total Funding = $1,686,567**

9. Principal Investigator, Shaw, A. K., Controlling the Apparent Vocal Effort of Synthetic Speech, Air Force Research Lab, WPAFB via Veridian Corporation. (Jan-01 to Sep-03, $114,264)


   **Note:** A consortium of 4 Universities and 3 Corporations is conducting this 3-year project with $1.4mil/year award from DARPA.

12. Principal Investigator, Shaw, A. K., Algorithms for High-Range Resolution Automatic Target Recognition, AARC (via Sverdrup Corp.), Wright Patterson Air Force Base, Dayton, OH. Program Monitor: Dr. Rob Williams (June 1996 to June 2001, $143,466)

13. Principal Investigator, Shaw, A. K., - Automatic Target Recognition using High-Range Resolution Data, jointly funded by AFOSR and Wright Laboratories, Program Monitors: Dr. Jon Sjogren and Dr. Rob Williams (April 1997 to December 1997, $31,486)

14. Principal Investigator, Shaw, A. K., Pipelined and Systolic Architectures for Signal Processing, Ohio Research Challenge Award, Wright State University. (June, 1997 to May 1999, $16,222)


16. Principal Investigator - A. K. Shaw, High Resolution DOA Estimation, Research Incentive Award, Graduate Research Council, Wright State University. (July 1994 to June 1995, $7,500)

17. Principal Investigator - A. K. Shaw, Digital Signal Processing Algorithm for Digital EW Receivers, AFOSR - Research and Development Laboratory, Research Initiation Program, Program Monitor: Dr. James B. Y. Tsui, Avionics Laboratories, Wright-Patterson AFB (January 1993 to December 1993, $20,000)


22. Travel Grant, Graduate Research Council, Wright State University (September 1992, $450).

23. Travel Grant, Graduate Research Council, Wright State University (December 1991, $1,200).

TECHNICAL REPORTS


THESIS SUPERVISED

1. Randy Depoy Ph.D.-EE, LiDAR-SAR Related topic - in progress (Dissertation Director)
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<tr>
<th></th>
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<td>Bashar Antoon</td>
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<td>Kandarp Patel</td>
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<td>Analysis Of Human Echolocation Waveform For Radar Target Recognition, 2013</td>
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<td>Randy Depoy</td>
<td>MS-EE</td>
<td>&quot;UHF-SAR and LIDAR &quot;Complementary Sensor Fusion for Unexploded Buried Munitions Detection,&quot; 2012</td>
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<td>Sivaram Bandaru</td>
<td>MS.-EE</td>
<td>“Turbo-Coding and Space-time Wireless Communication”.</td>
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<td>Anindya Paul</td>
<td>MS-EE</td>
<td>“Improved Target Recognition and Target Detection Algorithms using HRR Profiles and SAR Images”, September, 2003</td>
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<td>Koel Das</td>
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<td>“Perceived Distance of Synthesized Speech and Automatic Speaker Recognition using F0 Manipulation”, December 2002</td>
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<td>Srikanth Pokala</td>
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<td>“Two-Dimensional Filter Design using Structured Matrix Approximation,” 1995</td>
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22. Wei Xia

23. Shubhasish B. Kundu

24. Richard A. Mitchell
   MS-EE, “Speech and Speaker Recognition with a Time Delay Neural Network,” 1990 (Thesis Director)

Thesis Committee Memberships (partial list)

1. Jian Ming

2. Prithiviraj Tissainayagam

3. Erik Blasch
   Ph.D.-EE, “Simultaneous HRR Target Tracking and Identification,” April, 2002 (Committee Member)

4. Arunesh Roy
   MS-EE, “Synthesis of Controllers using the Polytope Algorithm,” June 1999, (Committee Member)

5. Aneesa Kunju
   MS-EE, “An FPGA Implementation of a 2D Pipelined Median Filter,” June 1999, (Committee Member)

6. Masoud Pourali
   MS-EE, “Quality Power for Sensitive Load,” June 1999, (Committee Member)

7. Yusheng Sun
   MS-EE, “Multirate Model Based Multipattern Data Association and Target Tracking Algorithm,” June 1998, (Committee Member)

8. Rajamohana Hegde
   MS-EE, “Design of Digital Filters using the Maximally Flat Criterion,” July 1996 (Committee Member)

9. Sanjiv M. Karani
   MS-EE, “Geometric Invariance in Computer Vision Considering Multiresolution Approaches,” 1995 (Committee Member)

10. Gwo-Jieh Wang
    MS-EE, “Real-Time Adaptive Multiresolution Multiple-Model Target Tracking,” 1994 (Committee Member)

11. Weichang Wang
    MS-EE, “Multiplatform Multiresolution Distributed Filtering for Maneuvering Targets with Adaptive-Rate Data Communication,” 1994, (Committee Member)

12. Hong-Hui Xu
    MS-EE, “Integrating MHT/SB with IMM for Advanced Target Tracking,” December 1993 (Committee Member)

13. Matthew P. Dierking
    MS-EE, “A Spinning Mirror System for Laser Receiver Absolute Response Evaluation,” 1991 (Committee Member)

14. Ron Kamm
    MS-EE, “High-Speed Spectral Estimation using an Optical Implementation of the Discrete Hartley Transform,” 1991 (Committee Member)

15. Thulasinath Manickam
    MS-EE, “Principal Component Analysis of Multidimensional Systems: Theory and Applications,” 1990 (Committee Member)
16. Clay Breznik  
MS-EE, “A Neural Network for Detecting Edges in a Gray Scale Image,” 1989 (Committee Member)

17. John Mossing  
MS-CS, “Developing a Personal Computer Based Digital Signal Processing System,” 1991 (Committee Member)

18. Deepak Advani  
MS-CS, “Design and Implementation of a Driver for Token Ring LAN under UNIX Environment,” 1990 (Committee Member)

## SERVICE AND ACADEMIC OUTREACH

### UNIVERSITY, COLLEGE AND DEPARTMENT

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<th>University Committee</th>
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<td>Associate Editor</td>
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<td>Program Committee</td>
<td>2003</td>
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<tr>
<td>Panelist, Phenomenology Based ATR</td>
<td>April, 2000</td>
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<td>December, 1999</td>
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<td>Secretary</td>
<td>1993-94</td>
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Member, 1989
Organizing Committee

IEEE International Conference on
Systems Engineering, Dayton OH
APPENDIX A

STATEMENT ON TEACHING

A career in teaching ranks among the noblest of all professions. I strongly believe that a Professor's primary responsibility and highest priority should be teaching \textit{i.e.,} imparting quality education; and I truly enjoy teaching a wide variety of undergraduate and graduate level courses.

Indeed, for an university the students we graduate are primarily the final products. Our excellence can perhaps be measured best by the quality of the graduates we offer to the society at large. Hence, as educators, our professional pride is most naturally tied to the achievements and successes of our students.

In facing the increasingly challenging working world beyond the university, our engineering graduates must receive a well-balanced engineering education with strong moorings in general education and social sciences in order to become successful as engineers, while being an active participant in the society. As professors it is our responsibility, indeed our duty, that we prepare and expose our students to such well-balanced and broad curricula.

Electrical Engineering is a rapidly growing field that is continually evolving and advancing in diverse dimensions. Hence, it is absolutely necessary for engineering educators to remain on top of the current developments by actively researching emerging theories and technologies for possible adaptation in future course curricula, or for constantly updating current course offerings. Perhaps more importantly, without continuous involvement in current research, it is impossible to train or advise graduate students in cutting-edge research topics. Hence, of necessity, a career in teaching thrives in ceaseless exchange and enrichment of new research ideas and it has always remained my only career goal.

In order to improve the effectiveness of my teaching, I have taken the following steps in the past several years:

1. In most Junior and Senior level undergraduate EE courses, I ask the students to take Preparatory quizzes on the first day of classes. These quizzes are meant to refresh the students’ background on the prerequisite material they ought to have to perform well in the course. I go over the solutions along-with handouts in the next class day. Many students, who may have taken the pre-requisites a while back or lack the necessary mathematical background, find the coverage of preparatory material very useful.

2. In several of my undergraduate courses, I provide my own detailed class-notes to all students before the class meets. The students find this very helpful while preparing for the class. This also allows them to concentrate more on comprehending the materials during the lectures and they can actively participate in class discussions without having to worry about jotting down class notes.
3. I solicit written anonymous feedback from all students in all courses at least once or twice a quarter during the quarter. I have found this to be a remarkably helpful tool in gauging the students’ perception of the materials covered and their overall interest in the subject matter. It also helps me fine-tune my lectures to address the students’ specific concerns during the quarter.

4. I attended a full-day Seminar on effective teaching techniques organized by the College of Engineering and Computer Science in September 1991.

5. I completed a two-day teaching-effectiveness workshop administered by the SOCHE at their Research Park facilities in February 1992.

6. I participated in a full-day videoconference on “Total Quality Learning” (TQL) organized by the Wright State University in June 1993. One of the important concepts I had learnt from this workshop is that for each course there must be a predetermined set of learning objectives. Regardless of the grades that each student eventually receives, they must all master these minimal learning objectives in order to receive a passing grade. I do try my best to test students in this manner. I believe that the preparatory quizzes mentioned in item-2 above serve an important role as part of TQL.

7. I participated in a full-day short course on “Integrating Design into the Engineering Curriculum” organized by the Wright State University in December 1993.

8. On my request, two senior Professors of my department have attended several of my lectures. I have had long in-depth discussion with both of them on improving teaching techniques. Both my senior colleagues had also provided verbal and written feedback and constructive suggestions from which I have benefited much.

9. Videotaping of one of my courses throughout spring 1993 has been very useful for me in critiquing and improving my own teaching. I found this to be a remarkably effective self-improvement tool because it acted as a real eye-opener and I took this effort very seriously.

**CLASS AND LAB DEVELOPMENT AND IMPROVEMENT**

1. **EE-304 Laboratory**: Since 1995, I have taken charge of the Circuits II (EE-304) Lab in the Electrical Engineering Department. I have continued to reorganize and restructure the Labs throughout this period. In the first major re-organization in 1995, the design contents for all the existing Labs and Pre-Labs were enhanced and emphasized. All the Lab Manuals were converted to Latex files so that those could be updated more easily by a TA or by myself. All the assignments and design problems were reviewed and modified at the same time. A more comprehensive reorganization of the EE-304 Lab was undertaken in 97 when all the Labs were re-written in order to make them more user friendly. This was done by clearly listing all the components and equipment necessary for conducting each lab so that the students do not waste time in searching for those during Lab-time. The objectives and expectations for each Lab and Pre-Lab were also clearly specified. The sequence of the Labs was modified in order to keep
pace with the EE-303 lecture schedule, which most students take concurrently. Outdated materials were removed from some Labs and more current topics were added, where possible. Set-up circuits for some labs were also modified so that the available equipment in the lab inventory could be used more effectively. All the assignments and design problems were also modified or updated.

2. **EE-761-762-763 sequence:** I had originally developed and have continued to reorganize the graduate course sequence EE 761-762-763 further in the past few years. More current and advanced topics have been incorporated in the sequence with special emphasis on practical applications and computer-based Projects. The advanced level of EE-762 and EE-763 may be exemplified by noting that several of its course projects have led to IEEE conference publications.

3. **EE-322:** I was instrumental in restructuring the EE 322 Discrete-Time Linear Systems course to include digital filter design as well as several computer-aided course projects.

4. **EE-435 and DSP-Communication Design sequence:** In 1997, I have completely restructured the EE-435 course to include both Analog and Digital Filter Designs. The new course eliminates some repetitions of topics that existed in both EE-322 and the previous EE-435.

**PAPERS CO-WRITTEN WITH STUDENTS**

4 Journal papers and 21 Conference papers have been co-written with Graduate (MS) students.
STATEMENT ON RESEARCH

Curiosity is perhaps the mother of all new directions in research. A common trait among majority of tenured higher rank faculty in most schools is that they tend to remain active in a narrow area where they may have tasted some past success. Many researchers in university environments are hesitant of being a novice again, lest it should cause any pause in flow of publications. Hence, university researchers tend to limit their research to a comfortable zone rather than branch out into newer areas that the current marketplace may be demanding. Some university researchers tend to rely on graduate students to work out the details while involving themselves with the “big picture”. Of course, one could argue that there are certain benefits to this trend. However, I personally try to be open to new ideas and enjoy starting at the bottom of a brand new area, and working my way up the ladder. I think most of my success as a researcher has come about because I have not been afraid to change areas given an interesting challenge.

New Research Topics: Following my previous promotion, I have redirected my research focus to more current and practical problems with high potentials for long term research collaboration with the local Air Force Base as well as significant publication potential. The four new research areas that I am currently emphasizing are:

1. **Detection of Resonant Structures on Ground Targets**: In January-99, I had been asked by DARPA and AFRL/SNAA to look into the problem of detecting dispersion causing structures on ground targets to enhance target recognition capabilities. This is part of physics-based modeling that is one of the primary current research goals of the Air Force. This is an immensely complicated inverse problem that has hitherto remained unsolved. In the last 8 months we have developed a statistical parameter estimation and detection framework that has already shown excellent performance in computer simulations. We expect several Journal and Conference publications out of this research.

2. **Automatic Target Recognition**: Since Summer-96, one of the major thrust of my research has been on developing effective algorithms for Automatic Target Recognition (ATR) in an Air-to-Ground scenario for the US Air Force. In this era of precision strikes with minimum possible co-lateral damage, ATR research is of high priority to the USAF. I had begun working on this topic almost from the scratch with minimal prior exposure, although I realized soon that my previous background is quite well suited to conduct fruitful research in this area. This is a highly challenging field with long-term funding potential from various defense-related Government sources. In particular, Wright Lab has shown significant interest in our work and has funded our research for the past two years. Our research was also funded jointly by Air Force Office of Scientific Research (AFOSR). More significantly, with direct encouragement and involvement of the ATR Branch at WL, a DARPA-funded 3-year project is being con-
ducted now by a consortium of 4 Universities (WSU, Ohio State, Univ. of Cincinnati and University of Florida, Gainesville) and 3 Corporations with a $1.4mil annual budget. My allotment is about $65K per year. Wright Lab will also continue to provide about $30K per year to support our efforts. We have 2 conference papers published on our research so far and a journal paper is currently under preparation. One Master’s thesis has already been completed and three more are under way. I foresee enormous potential for this work benefiting WSU, both in terms of research accomplishments and funding.

3. **Pipelined and systolic implementation of DSP algorithms:** My previous work in Array Signal Processing and Spectrum Estimation had mainly centered on developing algorithmic solutions for these critical and classical problems. That field has attained certain maturity, and it was generally felt that with the advent of VLSI and advanced DSP hardware, time is ripe for hardware implementation of many of the Signal Processing algorithms developed over the past 2 decades. Hence, I had endeavored to develop hardware implementation of various DSP algorithms since 1995. We have 4 conference papers published on our research and a journal paper has been accepted for publication. One Master’s thesis, devoted entirely to this topic, has also been completed. We had also received an internal funding in the form of a Research Challenge award. However, I found out that research in this area is mainly concentrated in industries. Furthermore, the defense related funding agencies, including Wright Labs, showed little interest in funding this type of research. Hence, I have decided to continue some work in this area primarily due to my personal academic interest.

4. **Mathematical modeling of Microwave structures:** I have also conducted collaborative research with another Faculty member of our Department (Dr. Krishna Naishadham) where I have applied some of my System Identification algorithms for modeling microwave structures. Preliminary results have been quite encouraging and 2 Conference papers have already been presented. A Journal paper on these results is currently under 2nd review. I had also submitted a joint proposal (with Professor Naishadham and Professor Jean of CS Department) on this topic to Wright Lab. Although that proposal was not funded, another limited joint proposal with Dr. Naishadham as PI did come through. However, since I have not drawn any funds from this contract yet, I did not include this contract in my External Funding list. We are hopeful that if we can generate further preliminary results, additional funding from Wright Labs is a distinct possibility.

### Graduate students supported by External Grants

The following graduate students have been supported by various external funds:

**Total: 39 Quarters (full), 4 Quarters (part)**

1. Vinod Chandran – 1 quarter-MS (full)
2. Kiran Raj George – 1 quarter-MS (full)
3. Titash Rakshit – 7 quarters-MS (full)
4. Rajesh Vashist – 8 quarters-MS (full)
5. Vijay Bhatnagar - 7 quarters-MS (full), 1 quarter-Ph.D. (part, cost-shared with Dean)
6. Imtiaz Mohamed- 1 quarter-MS (full)
7. Srikant Pokala – 8 quarters-MS (full), 2 quarters-Ph.D. (part, cost-shared with Dean)
8. Wei Xia - 5 quarters-MS (full)
9. Tareque Ahmed – 1 quarter-MS (part)
10. Vinay Verma – 1 quarter-MS (full)

**Significance of Research Accomplishments and External funding**

i) **Research Citations:** The quality of a researcher’s contribution is perhaps best judged by the importance that is given to published work by other researchers in the same field. Over the years, many researchers throughout the world have cited a number of publications by myself and co-workers. The *ISI Science Citation Database* Search on the Internet produced more than 140 citations of our published work since 1990. Note that the Citation Index only considers papers cited in reviewed Journals and does not include citations in Conference publications. For a summary and details on the citations of my publications, please refer to the end of this Appendix.

ii) My prior work on frequency or Angles of Arrival (AOA) Estimation (published in the Trans. on ASSP in June 1986) has been detailed in several major textbooks used in many schools in graduate and undergraduate courses. Our algorithm is often cited in the literature and is commonly referred to as KiSS (Note : the last S of KiSS denotes Shaw). It is probably the best algorithm available for maximum likelihood frequency estimation.

iii) In a 1994 paper, we had proposed a new method for AOA estimation called, “Minimum-Norm Method without Eigendecomposition”. According to one of the reviewers, our paper” …contains what I think is a significant breakthrough (comparable to spatial smoothing) in this narrow field of multiple source location…”

iv) All my journal articles are in well-respected and critically reviewed international journals and most are published in IEEE Journals, which go through rigorous standard for publication. Furthermore, most of the conference publications are in well-regarded IEEE-sponsored conferences or workshops such as ICASSP and ISCAS, where the acceptance rates are usually less than 40-50%.

v) I have been reviewing manuscripts for almost all the major International journals in our field for the past few years. I have also reviewed three NSF proposals for possible funding by two different NSF program monitors.
vi) Barring one joint work supported by the WPAFB, I am the *sole* principal investigator in all my externally funded projects and sub-contracts. These projects were awarded based on nationwide competition.

vii) I have been successful in bringing in more than $600K of external funding to Wright State since 1988. I have also received about $28K of internal funding.

viii) I have been asked to serve as External Examiner for an MS thesis from an Australian University as well as for a Ph.D. Dissertation of a University in Singapore.

ix) The College of Engineering and Computer Science, Wright State University recognized my research efforts with an “Excellence in Research” award for the year 1993-94.

x) I have been appointed an Associate Editor of the IEEE Transactions of Signal Processing to serve for the period of Feb-98 to Jan-2002. This is the most eminent journal on Signal Processing research in the world and I consider this appointment to be an important recognition of my professional career so far.

### Summary of Citations of articles Authored and Co-authored by Arnab Shaw

The Database Search results for “Cited Reference Search” of *ISI (Institute for Scientific Information) Citation Databases* are enclosed next. The searches were conducted in the “Full Search” mode, using the first author names, as appeared in the articles that cited the reference. The following Table is a brief summary of the number of citations for each cited author/co-author name used as the Search Key.

<table>
<thead>
<tr>
<th>Cited First Author Name (Search Key)</th>
<th>Number of Hits</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaw AK</td>
<td>1+5+3+3+1+2+2+5+1+1+1+2+5+1+1+2+3</td>
<td>39</td>
</tr>
<tr>
<td>Shaw A</td>
<td>2+1</td>
<td>3</td>
</tr>
<tr>
<td>Scharf LL</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Kay SM</td>
<td>8+1</td>
<td>9</td>
</tr>
<tr>
<td>Kumaresan R</td>
<td>2+1+1+68+1+1+1+1+1+1+2+1+1+1+1+1</td>
<td>94</td>
</tr>
</tbody>
</table>

**Total number of Citations (1990-present) 146**

**Note:** Out of this total, 17 citations were by at least one of the co-authors of the cited articles. All the other citations have been by other researchers.
Curriculum Vitae

Dr. Zhiqiang Wu

Associate Professor
Department of Electrical Engineering
College of Engineering and Computer Science
Wright State University

Phone: (937)-775-5060 (Office)

Email: Zhiqiang.Wu@wright.edu
EDUCATION

DEGREES AWARDED

Ph.D. in Electrical Engineering, **Colorado State University**, December 2001.
M.S. in Electrical Engineering, **Peking University**, July 1996.
B.S. in Electrical Engineering, **Beijing University of Posts and Telecommunications**, July 1993.

PROFESSIONAL EXPERIENCE

**Associate Professor** (2009 - present), Department of Electrical Engineering, Wright State University, Dayton, OH.

**Assistant Professor** (2005 - 2009), Department of Electrical Engineering, Wright State University, Dayton, OH.

**Assistant Professor** (2003 - 2005), Department of Electrical and Computer Engineering, West Virginia University Institute of Technology, Montgomery, WV.

**Research Faculty** (2002 - 2003), Department of Electrical and Computer Engineering, Colorado State University, Fort Collins, CO.

**Postdoctoral Research Associate** (2001 - 2002), Department of Electrical and Computer Engineering, Colorado State University, Fort Collins, CO.

**Research Assistant** (1998 - 2001), Department of Electrical and Computer Engineering, Colorado State University, Fort Collins, CO.


ACADEMIC AWARDS


**Office of Naval Research** (ONR) Summer Faculty Fellowship, 2011 and 2012

**Excellence in Research Award**, College of Engineering and Computer Science, WSU, 2010

**Teaching Award Nominee**, College of Engineering and Computer Science, WSU, 2012

**Early Career Achievement Award**, College of Engineering and Computer Science, WSU, 2009

**Best Demo Award**, IEEE Globecom, 2010

**Finalist**, InterDigital & California Institute for Telecommunications and Information Technology Innovation Challenge Competition, 2012

TEACHING

New Courses Created:
EE4210/6210 Lab, 2012
EE473/673 Wireless Communication I, 2007
EE474/674 Wireless Communication I Lab, 2007
EE476/676 Wireless Communication II, 2007

Courses Taught at Wright State University:

EE421/621 Communication Theory
EE735 Wireless Communication Technique
EE736 Advanced Communication Technique
EE322 Linear System II
EE480/680 Wireless Communication
EE473/673 Wireless Communication I
EE474/674 Wireless Communication I Lab
EE476/676 Wireless Communication II

Courses Taught at West Virginia University Institute of Technology:


Courses Taught at Colorado State University:

Digital Communication, Advanced Digital Communication

Senior Design Supervised:

(1) Ryan Overman, Trenton Katter, Brian Thomas and Thomas Rawls, Reliable Communication from Ground Station to High Altitude Balloon;
(2) Josh Larson, Thomas Kesler, James Sears and Amy Minehart, Autonomous Antenna Steering for High Altitude Balloon;
(3) Adam Chen, Josh Beighle and Aaron Seyfried, High Altitude Balloon VOR-U;
(4) Greg Taylor, Brandon Bayer, and Tom Holmes, Software Defined Radio Video Transmission for High Altitude Balloon;
(5) Tabish Khan, Anthony Ciacelli, Richard Lawrence, Fuel Cell Power Source for MAV Sensors;
(6) Kyle McClary, Kevin Ufferman, Joshua Land, HAB Team DISCO: LED Tracker for HAB;
(7) Elliott Moser, Adam Carpenter, Daniel Marietta, HAB Team FoxHound: GPS Repeater for HAB;
(8) Chad Morris, Paul Cary, Adam Baker, HAB Team SDR: SDR Video for HAB;
(9) Leila Carmichael, Meshal Albattah, Nathan Binkley, HAB Team ATV: Analog TV Transmission for HAB;
Dominic Maga, Jason Bailey and Steve Powers, *Antenna Ground Station for High Altitude Balloon Project*;

Todd Rogers, Aoun Barki and Henok Feseha, *Centralized Power Bus for High Altitude Balloon Project*;

Andrew Crowdy, Steven Overmyer, *Robust Telemetry System for High Altitude Balloon Project*;

Brent Guenther, Adam Kelly and Mark Falknor, *Real Time Video Transmission for High Altitude Balloon Experiments*;


Brian Wirick & Sean Stevens: *High Altitude Balloon Solar Cell Experiment*;

Heithem Taleb, Lee Fetty and Jonathan Moore: *Wireless Text Radio based on GNU Radio*;

Steve Mascarella, Thomas Pestak, Chris Byers, *High Altitude Balloon Launch and Experiments*;

Paul Haschke, Mike Justice, Mike Valley, Alex Sennet, *GPS Wireless Transmission via Bluetooth*;

Richard Reid, Pete Swartz, *Bluetooth Tracking Sensor*;

Shaun Frost, *A Non-Linear Flash Analog to Digital Architecture for Sinusoidal Input Signals in Communications*;

Michael Andras, Dan Rahn, *Centralized Power Bus for High Altitude Balloon Experiments*;

William Keatts, *Low-Cost Motion Detection and Counter Attacking Testbed for Swarm UAVs*;

Terry Cunningham and Paul Casto: *Performance Testing of OFDM Wireless Transmission in Mobile Channel*;

**Postdoc Researchers Supervised:**

Yao Ma, Research Assistant Professor at WSU, 2009-2012

Bing Xie, Peking University, Visiting Scholar at WSU, 2009-2010

Zheng Dou, Harbin Engineering University, Visiting Scholar at WSU, 2014

Yun Lin, Harbin Engineering University, Visiting Scholar at WSU, 2014

**Ph.D. Dissertation Supervised:**


Xue Li, “SMSE Framework Based Cognitive Radio in Mobile Environment”, 2012

**Master Theses Supervised:**


(3) Brent Gunther, “Multi-User Signal Classification Via Cyclic Spectral Analysis,” 2010
(6) Meng Wu, "Inter-Carrier Interference Cancelation in Multi-carrier Transmission”, June 2008
(7) Xue Li, ”Novel Approximation Method for Sum Lognormal Distribution”, August 2008
(9) Hemanth Kumar, "OFDM and Multi-carrier Transmission for Small UAV Communication”, WVUIT, 2005
(10) Abhishek R. Sakhare, ”Air Borne Network for Swarm UAVs”, WVUIT, 2004

Independent Study Supervised:
Ruolin Zhou, Non-Binary Modulation in Wireless Communication;
David Chaboty, Bluetooth Digital Data Transmission in Interference Dense Environment;
Deepak Garikapati, Software Defined Radio Based Digital File Transmission;
Correy Sheppeard, Digital Communication;
Tyler Gareky, Digital Communication;
Pranjali Shelgikar, Multiple Input Multiple Output Stabilization.

Advising Ph.D. Students as Committee Chair:
John Ellinger (passed proposal), Charles Berdanier (passed proposal), Yang Qu

Advising Ph.D. Students as Committee Member:
Qi Zhang, Qian Han, Paul Bender, Mike Peterson, Rafael Aleman, Lee Patton, Tao Zhang

External Funded Student Support :
(1) Josh Sanderson, 4 quarters (2/3 of Fall 2012 Semester, 2/3 of Spring 2013 Semester, 2/3 of Fall 2013 Semester, 2/3 of Spring 2014 Semester)
(2) Qu Yang, 4.66 quarters (Fall 2012 Semester, 2/3 Fall 2013 Semester, 2/3 Spring 2014 Semester, Summer 2014)
(3) Qian Han, 4.66 quarters (Spring 2012, Summer 2012, Fall 2012 Semester, Spring 2013 Semester)
(5) Brent Guenther, 4 quarters (Fall 2009, Winter 2010, Spring 2010, Summer 2010)
(6) Arvind Kumar, 1 quarter (Fall 2009)
(7) Eric Like, 3 quarters (Fall 2006, Winter 2007, Spring 2007)

(9) Ryan Brown, 3 quarters (Fall 2007, Winter 2008, Spring 2008)

(10) Omer Mian, 2 quarters (Winter 2008, Spring 2008)


(12) Meng Wu, 1 quarter (Summer 2007)

(13) Hemanth Kumar, 3 semesters (Spring 2004, Fall 2005, Spring 2005)

Total Quarters Support: 73 quarters (50 quarters since last promotion)

RESEARCH GRANTS SINCE LAST PROMOTION


(2) “Software Defined Radio Laboratory Platform for Enhancing Undergraduate Communication and Networking Curricula,” $600,000 (my share $300,000), 669290, PI, National Science Foundation, October 2013 - September 2016


(4) “Cognitive Radio and Cognitive Jamming via Tight Coupling with Navigation,”, Phase I, single PI, $45,000, 668891, Air Force Research Laboratory, March 2012-March 2013

(5) “RF Localization via Phase Variance,” single PI, $25,000, 668782, Air Force Research Laboratory, November 2012 - October 2013


(7) “Spectrally Compliant Communication Waveform Generator over Non-Contiguous Spectrum Bands,”, single PI, $24,000, 668920, Office of Naval Research, March 2012 - November 2012


(12) “Waveforms Optimization Algorithms for Electronic Warfare Countermeasures Development”, co-PI, $130,000 (my share $120,000), 667614, Air Force Research Laboratory, March 2009 - September 2011

PUBLICATIONS

BOOKS


**JOURNAL PUBLICATIONS**

**SINCE LAST PROMOTION**


BEFORE LAST PROMOTION


CONFERENCE PRESENTATIONS/PROCEEDINGS

SINCE LAST PROMOTION


[13] Q. Han, X. Li, M.A. Temple and Z. Wu, “Inter-carrier Interference Cancellation for Wideband OFDM in High Speed Aerial Vehicle Communication”, IEEE International Conference on Computing, Networking and
Communications (ICNC) Workshop 2013, [R]


[64] Z. Wu, D. Wiegandt and C. R. Nassar, "High-Performance 64-QAM OFDM via Carrier Interferometry Spreading Codes," IEEE VTC 2003 [R]


SERVICES

Co-Chair:
WSU Campus Scholarship and Innovation Campaign, 2006, 2007 and 2008

Mentor:
WSU Amateur Radio Club, 2010-present

Organizer:
WSU Cognitive Radio Workshop, 2011

Member:
WSU College of Engineering and Computer Science Program Development Committee of Multidisciplinary Engineering Program, 2011

Member:
WSU College of Engineering and Computer Science Scholarship Committee, 2006-2008

Member:

Chair:
Department Lab Resource Committee, 2007-2012, 2014-present

Member:
Department Undergraduate Studies Committee, 2010-2012, 2014-present

Member:
Department Graduate Studies Committee, 2005-2006

Member:
Department Faculty Search Committee, 2006-2007

Guest Editor:
IEEE MMTC E-Letter Special Issue on Acoustic and Audio Communication, 2011

Chair:
IEEE Communications Society Technical Committee on Multimedia Communications, Acoustic and Speech Processing Interest Group 2012-present

Co-Chair:
IEEE Communications Society Technical Committee on Multimedia Communications, Acoustic and Speech Processing Interest Group 2010-2012

Co-chair:
IEEE International Conference on Multimedia & Expo 2011 Workshop on Speech and Video Coding and Communications

Member:
IEEE

Member:
IEEE Communications Society, IEEE Information Theory Society
IEEE Vehicular Technology Society, SPIE, ASEE

Member:
The Honor Society of Phi Kappa Phi

Track Chair:
IEEE VTC 2013 Fall

Technical Committee Member:

**Dean’s Commendation** for outstanding efforts in supervising 2006 and 2007 High Altitude Balloon Senior Design Projects, Wright State University.

Served as expert reviewer for John Wiley & Sons Publishing House.

Served as peer reviewer for various journals and conferences including:

- IEEE Transactions on Wireless Communications
- IEEE Transactions on Communications
- IEEE Transactions on Vehicular Technology
- IEEE Journal on Selected Areas in Communications
- IEEE Journal on Selected Areas in Signal Processing
- IEEE Communication Letters
- IEE Electronics Letters
- IEEE ICC Conference
- IEEE Globecom Conference
- IEEE CrownCom Conference
- IEEE UWBST Conference
- IEEE WCNC Conference
JIAFENG XIE

Address: 230 RUSS center, Department of Electrical Engineering, Wright State University, Fairborn, OH 45324
Phone: 937-775-5037
Email: jiafeng.xie@wright.edu

RESEARCH INTERESTS

- VLSI cryptographic circuits for emerging embedded system security
- VLSI systems for emerging signal/image processing, and biomedical application
- Algorithm-architecture design for resource-constrained systems

EDUCATION

University of Pittsburgh, Pittsburgh, PA    01/2013-12/2014
- Ph.D. in electrical engineering, GPA 4.0/4.0
- Course work related to advanced computer architecture: emerging memory, image processing and computer vision, control theory, and signals and systems

Central South University, Changsha, Hunan, China    09/2007-07/2010
- M. E. in control science and engineering
- Course work mainly focused on digital circuits, control theory, signals and systems, power system optimization, intelligent control, and pattern recognition, and biomedical system

Yanshan University, Qinhuangdao, Hebei, China    09/2012-07/2006
- B. E. in measuring and control technology and instrumentations
- Main curriculum in automatic control, power electronics, mathematics, signal processing, pattern recognition, circuits and system, communication technology, computer programming, and physics

EXPERIENCE

Professional experience

- Assistant Professor, Department of Electrical Engineering, Wright State University, 1/2015-present
- Researcher, School of Information Science and Engineering, Central South University, September 2011–June 2012. Project: hardware efficient digital image processing systems for emerging video standard
- Researcher, School of Information Science and Engineering, Central South University, September 2011–June 2012. Project: hardware efficient finite field multiplier for modern cryptographic systems
- Researcher, School of Information Science and Engineering, Central South University, September 2010–June 2011. Project: temperature modeling and
control strategy for large vertical furnace

- Research assistant, School of Information Science and Engineering, Central South University, September 2009–June 2010. Project: FPGA implementation of digital signal processing systems
- Research assistant, School of Electrical Engineering, Yanshan University, January 2006–July 2006. Project: emerging optical communication system

Teaching experience

- Instructor for Course EE-2010- *Circuit Analysis I*, Department of Electrical Engineering, Wright State University, 1/2015-present
- Teaching fellow for Course *Introduction to Image Processing*, Department of Electrical and Computer Engineering, University of Pittsburgh, September 2014–December 2014
- Teaching fellow for Course *Computer Organization*, Department of Electrical and Computer Engineering, University of Pittsburgh, May 2013–August 2013
- Teaching fellow for Course *Linear Circuits and System-II*, Department of Electrical and Computer Engineering, University of Pittsburgh, January 2013–April 2013
- Teaching assistant for mentoring graduate student on project *Finite Field Multiplier and Its Hardware design*, School of Information Science and Engineering, Central South University, April 2011–June 2012
- Teaching assistant for mentoring undergraduate student on project *FPGA-Based FIR Filter Design*, School of Information Science and Engineering, Central South University, September 2009–June 2010
- Teaching assistant for Course *Automatic Control*, School of Information Science and Engineering, Central South University, September 2007–June 2009

Industrial experience


Professional activities

Circuits, Computer and Systems

- Review committee member for the 2011 International Conference on Opto- Electronics Engineering and Information Science (ICOEIS 2011).

Research grants

- Grant proposal: Hardware efficient finite field multiplier for modern cryptographic system, to be submitted to NSF of China (Role: Co-PI. With Prof. Jianjun He, Central South University)

AWARDS & HONORS

- College Scholarship, Yanshan University, 2003
- Department Outstanding Thesis Award, Yanshan University, 2006
- Graduate Fellowship, Central South University, 2007, 2008, 2009, and 2010
- Best Paper Award, School of Information Science and Engineering, Central South University, 2009
- Best Paper Award, School of Information Science and Engineering, Central South University, 2011
- Teaching fellow scholarship, Department of Electrical and Computer Engineering, University of Pittsburgh, 2013, and 2014
- EE Rath Scholarship, Department of Electrical and Computer Engineering, University of Pittsburgh, 2013

PUBLICATIONS In journals


9. Jianjun He, **Jiafeng Xie**, and Mingfang He, “Area-efficient systolic multipliers for finite field $GF(2^m)$ based on irreducible trinomial”, *Journal of Convergence Information Technology*, vol. 6, no. 5, pp. 305-313, 2011. *(Corresponding author)*

10. Jianjun He, and **Jiafeng Xie**, “Hardware efficient approach for memoryless-based multiplication and its application to FIR filter”, *Journal of Computers*, vol. 6, no. 11, pp. 2376-2381, 2011. *(Corresponding author)*


**In conference**


**In progress**


XIAODONG (FRANK) ZHANG
Associate Professor, Department of Electrical Engineering, Wright State University, Dayton, OH 45435, USA
Tel: (937)775-4463 Email:xiaodong.zhang@wright.edu

EDUCATION
- Ph.D. in Electrical Engineering, University of Cincinnati, Cincinnati, OH, December 2001.
- M.S. in Electrical Engineering, Shanghai Jiao Tong University, Shanghai, China, March 1997.
- B.S. in Electrical Engineering, Huazhong University of Science and Technology, Wuhan, China, July 1994.

PROFESSIONAL EXPERIENCE
- 09/2012 – present Associate Professor, Department of Electrical Engineering, Wright State University, Dayton, OH
- 09/2007 – 08/2012 Assistant Professor, Department of Electrical Engineering, Wright State University, Dayton, OH
- 08/2005 – 08/2007 Sr. Researcher, Electrical & Controls Integration Lab, General Motors R&D Center, Warren, MI

PROFESSIONAL MEMBERSHIPS
- Associate Editor, IEEE Transactions on Control Systems Technology, 2012 - present.
- Member, IFAC Steering Committee on Fault Detection, Supervision and Safety for Technical Processes, TC 6.4
- Senior Member, IEEE

ACADEMIC AWARDS
- Second Place, Competition on Fault Detection and Isolation for Wind Turbines, the 2011 IFAC World Congress, Milan, Italy.
- NASA Tech Brief Award, 2010.
- Faculty Early Career Achievement Award, College of Engineering and Computer Science, Wright State University, 2010.
- Finalist for the ABB Best Application Paper Award, the 2009 IFAC SAFEPROCESS Symposium, Barcelona, Spain.
- Finalist for the Paul Frank Best Theoretical Paper Award, the 2009 IFAC SAFEPROCESS Symposium, Barcelona, Spain.
- Ralph H. Lee Department Prize Paper Award, the Industrial and Commercial Power System Department, IEEE Industry Applications Society, 2004.
- Best Ph.D. Dissertation Award, Department of Electrical and Computer Engineering and Computer Science, University of Cincinnati, 2002.
GRADUATE STUDENTS ADVISED

1. M.S. Students
   4) Qi Zhang, *Distributed Fault Detection for a Class of Large-Scale Nonlinear Uncertain Systems*, Winter 2011.
   8) Hui Chen, expected Fall 2013.

2. Ph.D. Students
   1) Qi Zhang, *Robust Distributed Fault Diagnosis in Nonlinear Large-Scale Uncertain Systems*, Summer 2013.
   2) Remus Avram, spring 2012 – present, candidacy exam passed summer 2013, dissertation expected 2015.

SCHOLARSHIP

- **Refereed Journal Papers**


**Patents**


**NASA Tech Briefs**


**Refereed Conference Papers**
1. M. Khalili and X. Zhang, “Distributed fault detection in interconnected nonlinear uncertain systems,” the 2014 IEEE Conference on Decision and Control, Maui, Los Angeles, CA.


9. X. Zhang and Qi. Zhang, “Distributed fault detection and isolation in a class of large-scale nonlinear uncertain systems,” The 2011 IFAC World Congress, Milan, Italy.


- **Paper Citations** (3 papers with highest number of citations based on Google Scholar)
## GRANTS FUNDED

- **External Funding** (Total Awarded: $526,698)

<table>
<thead>
<tr>
<th>Title</th>
<th>WSU Fund Number</th>
<th>Funding Amount</th>
<th>Duration</th>
<th>Funding Agency</th>
<th>P.I.</th>
<th>Co-P.I.s</th>
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<tr>
<td>Data-Driven Approach to Lead Acid Battery State-of-Health Monitoring</td>
<td>667096</td>
<td>$76,014</td>
<td>10/2007-12/2010</td>
<td>General Motors R&amp;D Center</td>
<td>Zhang</td>
<td>N/A</td>
</tr>
<tr>
<td>A Nonlinear Adaptive Approach to Isolation of Sensor Faults and Component Faults</td>
<td>667568</td>
<td>$30,000</td>
<td>01/2009-07/2009</td>
<td>NASA SBIR Phase I, Impact Technologies</td>
<td>Zhang</td>
<td>N/A</td>
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<tr>
<td>Multi-Agent Health Management System</td>
<td>667602</td>
<td>$20,833</td>
<td>03/2009-09/2009</td>
<td>Army SBIR Phase I, Intelligent Automation, Inc.</td>
<td>Zhang</td>
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<tr>
<td>Mobile-Agent-Based Autonomous Data Fusion for Distributed Sensors</td>
<td>667701</td>
<td>$21,000</td>
<td>06/2009-11/2009</td>
<td>ONR SBIR Phase I, Impact Technologies</td>
<td>Zhang</td>
<td>N/A</td>
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<tr>
<td>Fault Prognosis of Automotive Electric Power Generation and Storage Systems</td>
<td>667597</td>
<td>$49,519</td>
<td>03/2009-08/2010</td>
<td>General Motors R&amp;D Center</td>
<td>Zhang</td>
<td>N/A</td>
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<tr>
<td>Adaptive Learning Methods for Battery Capacity Estimation, sponsored by Delphi Corporation</td>
<td>667731</td>
<td>$20,000</td>
<td>06/2009-08/2010</td>
<td>Delphi Corporation</td>
<td>Zhang</td>
<td>N/A</td>
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<tr>
<td>Multi-Agent Health Management System</td>
<td>668063</td>
<td>$81,335</td>
<td>04/2010-06/2012</td>
<td>Army SBIR Phase II, Intelligent Automation, Inc.</td>
<td>Zhang</td>
<td>N/A</td>
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<tr>
<td>Mobile-Agent-Based Autonomous Data Fusion for Distributed Sensors</td>
<td>668208</td>
<td>$57,999</td>
<td>09/2010-02/2012</td>
<td>ONR SBIR Phase II, Impact Technologies</td>
<td>Zhang</td>
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- **Internal Funding**

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<th>Duration</th>
<th>Funding Agency</th>
<th>P.I.</th>
<th>Co-P.I.s</th>
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<tr>
<td>SOH Monitoring of Li-Ion Batteries</td>
<td>667125</td>
<td>$20,000</td>
<td>03/2008-08/2010</td>
<td>WSU Research Challenge</td>
<td>Zhang</td>
<td>N/A</td>
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<tr>
<td>Direct Fuel Injection and Intelligent Control of Small Engines</td>
<td>668035</td>
<td>$35,000</td>
<td>06/2010-03/2011</td>
<td>WSU Research Challenge</td>
<td>Dong</td>
<td>Zhang</td>
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<tr>
<td>Intelligent Distributed Fault Detection and Isolation</td>
<td>668378</td>
<td>$17,000</td>
<td>06/2011-02/2012</td>
<td>WSU Research Challenge</td>
<td>Zhang</td>
<td>N/A</td>
</tr>
</tbody>
</table>
PROFESSIONAL SERVICE

2. Member, IFAC Steering Committee on Fault Detection, Supervision and Safety for Technical Processes, TC 6.4, 2010-present.
3. Associate Editor, Conference Editorial Board of the IEEE Control Systems Society, 2008-2011.
4. Program Committee Member, the *50th IEEE Conference on Decision and Control and European Control Conference*, December 2011, Orlando, Florida.
5. Program Committee Member, the *20th International Conference on Artificial Neural Networks (ICANN 2010)*, Thessaloniki, Greece.
6. Program Committee member, the *19th International Conference on Artificial Neural Networks (ICANN 2009)*, Limassol, Cyprus.
7. Program Committee Member, the *2005 Joint IEEE International Symposium on Intelligent Control and Mediterranean Control Conference*, Limassol, Cyprus.
CURRICULUM VITA

Yan Zhuang, Ph.D., Assistant Professor of Electrical Engineering
Department of Electrical Engineering
Wright State University
Dayton, Ohio 45435

EDUCATION

<table>
<thead>
<tr>
<th>Institution</th>
<th>Concentration</th>
<th>Degree/Date</th>
</tr>
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<tbody>
<tr>
<td>Johannes Kepler University, Linz, Austria</td>
<td>Physics</td>
<td>Ph.D., 2000</td>
</tr>
<tr>
<td>Beijing Laboratory of Electron Microscopy,</td>
<td>Materials of Science</td>
<td>M.Sc. 1992</td>
</tr>
<tr>
<td>Chinese Academy of Sciences, China</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fudan University, China</td>
<td>Physics</td>
<td>B.Sc. 1989</td>
</tr>
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</table>

PROFESSIONAL EXPERIENCE

<table>
<thead>
<tr>
<th>Institution</th>
<th>Position</th>
<th>Dates</th>
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<tbody>
<tr>
<td>Wright State University</td>
<td>Associate Professor</td>
<td>2013-present</td>
</tr>
<tr>
<td>Wright State University</td>
<td>Assistant Professor</td>
<td>2008-2013</td>
</tr>
<tr>
<td>Delft University of Technology</td>
<td>Assistant Professor</td>
<td>2005-2008</td>
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<tr>
<td>Delft University of Technology</td>
<td>Postdoctoral Research Fellow</td>
<td>2000-2005</td>
</tr>
<tr>
<td>Institute of Semiconductors, Chinese Academy of</td>
<td>Research Associate/Research</td>
<td>1992-1996</td>
</tr>
<tr>
<td>Sciences</td>
<td>Professor</td>
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</table>

PROFESSIONAL MEMBERSHIPS (members):

- Materials Science Society

ACADEMIC AWARDS

- AFOSR Summer Fellowship, 2012.
- Outstanding Scientist (Innovational Research Incentives Scheme - VIDI (2003), by Netherlands Organization for Scientific Research (equivalent to NSF Early Career Award in Netherlands, details in supplement)
- North-South-Dialogue Scholarship Program (1996-2000)

TEACHING

Courses Taught at Wright State University

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Times Taught</th>
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<tbody>
<tr>
<td>EE 3450/5450</td>
<td>Electromagnetics</td>
<td>7</td>
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</table>
EE 346/546, 4420/6420: Transmission lines, waveguides, and radiating systems
EE 445/645: Electromagnetic compatibility
EE 4460/6460: Microwave circuit design
EE 7480: Advanced microwave engineering
EE 480/680: Micro/nano- fabrication engineering for VLSI and MEMs

New Course Development
1. EE 480/680 “Micro/nano- fabrication engineering for VLSI and MEMs” four (4) credit hours, Spring 2009.
2. EE 880 “Advanced microwave engineering,” four (4) credit hours, Spring 2010.
3. RF teaching lab for EE442 and 446
4. MEMs lab for EE480

Postdoc. Supervised

<table>
<thead>
<tr>
<th>Name</th>
<th>Thesis Title</th>
<th>Time period</th>
<th>University</th>
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</thead>
<tbody>
<tr>
<td>S. Frégonèse</td>
<td>Disposable dot field effect transistor for high speed Si integrated circuits</td>
<td>2005.01 – 2006.01</td>
<td>TUDelft, Netherlands</td>
</tr>
<tr>
<td>Y. Xing</td>
<td>Graphene based RF bio-/chemical sensors</td>
<td>2009.01 – 2010.01</td>
<td>WSU, USA</td>
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Ph.D. Dissertation Supervised

<table>
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<tr>
<th>Name</th>
<th>Dissertation Title</th>
<th>Graduation Date</th>
<th>Degree</th>
<th>University</th>
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<tbody>
<tr>
<td>Y. Ma</td>
<td>Ferroelectric materials and artificial dielectric layer structures for microwave integrated circuit technologies</td>
<td>March 2011</td>
<td>Ph. D</td>
<td>TUDelft, Netherlands</td>
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Ph.D. Dissertation Supervising

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<th>Degree</th>
<th>University</th>
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</thead>
<tbody>
<tr>
<td>S. Hussaini</td>
<td>Three dimensional integrated magnetic RF passive components</td>
<td>Aug. 2015</td>
<td>Ph. D</td>
<td>WSU, USA</td>
</tr>
<tr>
<td>J. Myers</td>
<td>Atomic thin 2-D crystal materials and devices</td>
<td>Aug. 2016</td>
<td>Ph. D</td>
<td>WSU, USA</td>
</tr>
<tr>
<td>J. Evans</td>
<td>Implantable artificial cochlea device</td>
<td>Aug. 2016</td>
<td>Ph. D</td>
<td>WSU, USA</td>
</tr>
<tr>
<td>Name</td>
<td>Thesis Title</td>
<td>Graduation Date</td>
<td>Degree</td>
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<tr>
<td>K. Brockdorf</td>
<td>Graphene based RF/Microwave impedance chemical gas sensor</td>
<td>Aug. 2017</td>
<td>Ph. D</td>
<td></td>
</tr>
<tr>
<td>H. Min Jeon</td>
<td>Multiferroic materials for RF/microwave tunable components</td>
<td>Jan. 2018</td>
<td>Ph. D</td>
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**Master Thesis Supervised (WSU)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Thesis Title</th>
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<th>Degree</th>
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<tbody>
<tr>
<td>Sheena Hussaini</td>
<td>Radio frequency integrated bio-chemical impedance sensor</td>
<td>March 2011</td>
<td>Master</td>
</tr>
<tr>
<td>Xida Sun</td>
<td>Structured Silicon Macropore as Anode in Lithium Ion Batteries</td>
<td>Summer 2011</td>
<td>Master</td>
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<tr>
<td>Ruiping Zhou</td>
<td>Theoretical modeling of silicene and graphene for device applications</td>
<td>Spring 2012</td>
<td>Master</td>
</tr>
<tr>
<td>Joshua Myers</td>
<td>Surface impedance investigation by scanning microwave microscopy</td>
<td>Spring 2012</td>
<td>Master</td>
</tr>
<tr>
<td>Jiahui Wang</td>
<td>High-k materials based large scanning angle leaky wave antenna</td>
<td>Fall 2012</td>
<td>Master</td>
</tr>
<tr>
<td>Hyung Min Jeon</td>
<td>Mechanically and electrically reconfigurable leaky wave antenna</td>
<td>Spring 2013</td>
<td>Master</td>
</tr>
<tr>
<td>Gregory Hartman</td>
<td>Monolithically integrated non-reciprocal RF components</td>
<td>Spring 2013</td>
<td>Master</td>
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<tr>
<td>Bella Yao</td>
<td>Selective Free-Standing Through-Wafer Porous Silicon Membrane (SFTPSM) for Integrated Meta-material Devices</td>
<td>Spring 2013</td>
<td>Master</td>
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<tr>
<td>Jared Evans</td>
<td>Artificial thin film polymeric frequency selective artificial cochlea</td>
<td>Summer 2013</td>
<td>Master</td>
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</table>

**Master Thesis Supervising (WSU)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Thesis Title</th>
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<th>Degree</th>
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<tbody>
<tr>
<td>Pradyumna Aditva</td>
<td>Ferroelectric materials based tunable RF components</td>
<td>Spring 2015</td>
<td>Master</td>
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<tr>
<td>Timothy Jason Nicodemus</td>
<td>Formation NiFe nano wires for RF applications</td>
<td>Spring, 2015</td>
<td>Master</td>
</tr>
<tr>
<td>Zhonghang Ji</td>
<td>Theoretical study of strained induced band gap opening of 2-D material</td>
<td>Fall, 2014</td>
<td>Master</td>
</tr>
<tr>
<td>Carl Gross</td>
<td>Integrated RF nano-varactor</td>
<td>Spring, 2015</td>
<td>Master</td>
</tr>
<tr>
<td>FNU Kumar Vishal</td>
<td>Magnetostatic wave in multiferroic thin film</td>
<td>Spring, 2015</td>
<td>Master</td>
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</table>
## Graduate Student Committee Membership (Masters unless otherwise noted, total 9)

<table>
<thead>
<tr>
<th>Name</th>
<th>Thesis Title</th>
<th>Graduation Date</th>
<th>Advisor</th>
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<tbody>
<tr>
<td>Ruolin Zhou (Ph. D.)</td>
<td>A Software-defined Radio Based Hybrid Overlay/Underlay Cognitive Radio over Gray Space</td>
<td>Nov. 2011</td>
<td>John Wu (EE, WSU)</td>
</tr>
<tr>
<td>Huseyin Sagkol (Ph. D)</td>
<td>High-Aspect Ratio CMOS Add-on Modules for RF Passive Components</td>
<td>Mar. 2011</td>
<td>J. Burghartz (TUDelft)</td>
</tr>
<tr>
<td>Piyush J. Shah (Ph. D)</td>
<td>Nanostructured columnar thin films using oblique angle deposition: growth, SERs characterization and lithographic processing</td>
<td>May, 2012</td>
<td>Kefu Xue (EE, WSU)</td>
</tr>
<tr>
<td>Kirti Kant Paulla (Ph. D)</td>
<td>Computational Modeling of Nanosensors Based on Graphene Nanoribbons Including Electron-Phonon Effects</td>
<td>2014</td>
<td>Amir Farajian (ME, WSU)</td>
</tr>
<tr>
<td>R. M. Buzakuk</td>
<td>Dynamic footed with clock overlapping and load balancing in multiple paths for noise tolerance in dynamic CMOS circuit</td>
<td>Nov. 2011</td>
<td>H. Chen (EE, WSU)</td>
</tr>
<tr>
<td>Larsen, Mads Jacob Hedegaard</td>
<td>Non-Contact Probes for Characterization of THz Devices and Components</td>
<td>April, 2013</td>
<td>Elliott Brown (Phys. WSU)</td>
</tr>
<tr>
<td>Yang Qu</td>
<td>Software-Defined Radio based Blind Hierarchical Modulation Detector via Second-Order Cyclostationary and Fourth-Order Cumulant</td>
<td>May, 2013</td>
<td>John Wu (EE, WSU)</td>
</tr>
<tr>
<td>Hao Xue</td>
<td>Timing and power optimization using mixed-dynamic-static CMOS</td>
<td>June, 2013</td>
<td>H. Chen (EE, WSU)</td>
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<tr>
<td>Duo Zhang</td>
<td>Dynamic CMOS MIMO circuits with feedback inverter loop and pull-down bridge</td>
<td>July 2013</td>
<td>H. Chen (EE, WSU)</td>
</tr>
<tr>
<td>George J. Ramayya</td>
<td>Two Speed Control Of Residential Compressors</td>
<td>June 2014</td>
<td>Kazimierczuk (EE, WSU)</td>
</tr>
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</table>

**Undergraduate Students Supervised (total 61):**

Kent Weaver, Matt Evenhoe, Mike Chapmen, Alex Pringer, Ben Steinhauer, Cory Snyder, Andy Bishop, Phillip Cooley, Mikiyas Barkneh, James Blair, Scott Metzger, Barrett Harber, Yongxing Jiang, Kartik Mathihalli, Gregory Hartman, Brian S. Marshall, Ed
SCHOLARSHIP

Peer-Reviewed Journal Publications (*14 since appointment at WSU, out of total 56)
Average impact factor: 1.96, Total time cited: 362 according to Web of Science


**Peer-reviewed conference proceedings (5 since appointment at WSU)**


Conference Proceeding/Abstracts:

1. J. Evans, B. Goldenberg, Y. Zhuang, "Piezoelectric Thin Film Membrane Based Frequency Selective Artificial Cochlea" abstract accepted MRS, 2014 fall


### External Grant Funded

1) At Delft University of Technology (The Netherlands)

<table>
<thead>
<tr>
<th>Title</th>
<th>Funding (My share)</th>
<th>Duration</th>
<th>Funding Agency</th>
<th>PI/Co-PI</th>
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<tbody>
<tr>
<td>Ferromagnetic and ferroelectric materials for monolithic RF/Microwave technology</td>
<td>€ 600,000</td>
<td>01/04 to 01/09</td>
<td>Netherlands Organization for Scientific Research (VIDI)</td>
<td>PI</td>
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<tr>
<td>Disposable dot field effect transistor for high speed Si integrated circuits</td>
<td>€ 600,000</td>
<td>08/05 to 08/08</td>
<td>EU project</td>
<td>Co-PI</td>
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**Total Awarded: €1,200,000**

2) At Wright State University (U.S.A.)

<table>
<thead>
<tr>
<th>Title</th>
<th>WSU Acct.#</th>
<th>Funding Amount/ My share</th>
<th>Duration</th>
<th>Funding Agency</th>
<th>PI/Co-PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing, control and modeling for a quad-winged micro air vehicle platform</td>
<td>667493</td>
<td>$50,000/$25,000</td>
<td>11/01/08 to 08/31/09</td>
<td>DoD-STTR Phase I, Taitech</td>
<td>Co-PI</td>
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<tr>
<td>Sensing testing system for design of a quad-winged micro air vehicle</td>
<td>667734</td>
<td>$238,157/$142,000</td>
<td>08/01/09 to 08/31/10</td>
<td>DoD-DURIP</td>
<td>Co-PI</td>
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<tr>
<td>Deployable low power carbon nanotube sensors</td>
<td>667709</td>
<td>$200,000/$50,000</td>
<td>01/01/10 to 01/01/11</td>
<td>AFRL</td>
<td>Co-PI</td>
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<tr>
<td>Fundamentals of Low Dimensional Carbon Films Grown by Sublimation of SiC</td>
<td>668368</td>
<td>$78,782/$17,640</td>
<td>09/01/11 to 08/31/13</td>
<td>AFRL-DAGSI</td>
<td>PI</td>
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<tr>
<td>Atomic thin 2-D crystal materials and devices</td>
<td>668941</td>
<td>$28,032/$28,032</td>
<td>09/01/12 to 08/31/13</td>
<td>AFRL</td>
<td>PI</td>
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<td>Study on Plasmonics in 2D Materials</td>
<td>669230</td>
<td>$29,000/$29000</td>
<td>09/01/13 to 08/31/14</td>
<td>AFRL</td>
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<td>Artificial cochlea</td>
<td>668945</td>
<td>$124,222/$100,000</td>
<td>09/01/12 to 08/31/13</td>
<td>Advratech</td>
<td>PI</td>
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<td>MJB3 lithography</td>
<td>668304</td>
<td>$10,000/$10,000</td>
<td>10/26/10 to 10/26/11</td>
<td>AFRL</td>
<td>PI</td>
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<td>Multifunctional Oxide Heterostructure</td>
<td>669333</td>
<td>$60,443/$60,443</td>
<td>11/2013 to 11/2014</td>
<td>AFRL</td>
<td>PI</td>
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**Total Awarded: $818,636/$462,115**
**Internal Grant Funded**

<table>
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<th>Title</th>
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<th>Funding Amount / My share</th>
<th>Duration</th>
<th>Funding Agency</th>
<th>Position</th>
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<tr>
<td>Integrated sensing and modeling for bio-inspired micro flights</td>
<td>667540</td>
<td>$22,000/$11,000</td>
<td>01/01/09 to 12/31/09</td>
<td>University Research Council</td>
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<tr>
<td>Deployable bio-chemical sensor and organic LED based on graphene</td>
<td>668018</td>
<td>$30,000/$15,000</td>
<td>06/01/10 to 06/01/11</td>
<td>University Research Council</td>
<td>P.I.</td>
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<tr>
<td>Bio-inspired Hair-cell Sensor Development and Flow Measurement of Micro Air Vehicles</td>
<td>668368</td>
<td>$40,000/$20,000</td>
<td>04/01/11 to 03/31/12</td>
<td>University Research Council</td>
<td>Co-PI</td>
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**Total Awarded: $92,000/$46,000**

**SERVICE**

**WSU Committee Service**

- **Department Committee**
  - Lab-resources committee: member, 2008-present
  - Undergraduate studies: member, 2009-present
  - Ad Hoc EP program subcommittee: member, 2009-present
  - Ohio research scholar search committee: member, 2009
  - CECS Petitions Committee: member, 2013-
  - Search committee of Associate Dean for Research and Graduate Studies of CECS: member, 2013-08

**External Professional Service**

**Journal Reviewer**

- Journal of Applied Physics
- IEEE Transactions on Electron Devices
- IEEE Transactions on Magnetics
- SPIN
- IEEE Sensors Journal
Conference Paper Reviewer

- ISCAS2010
- MRS fall, 2010
- IEEE Intermag, 2012

Professional Service

- Section Chair: 12th Join MMM/Intermag Conference, Jan. 2013, Chicago, USA
- Invited speaker at AFRL, Dayton, USA, Sep. 14, 2012
- Invited speaker at AFRL, Dayton, USA, June 14, 2012
- Invited speaker at AFRL, Dayton, USA, Feb. 16, 2011
- Invited speaker at Stuttgart University, Germany, Jul. 22, 2007
- Invited speaker at Qinghua University, Beijing, China, Aug. 17, 2006
- Invited speaker at Institute of Semiconductors, Chinese Academy of Science, Beijing, China, Aug. 17, 2006
- Invited speaker at BCTM2005, Santa Barbara, USA, October 2005
- Section Chair: “RF integrated passives and devices”, Intermag2005 Conference, Japan, April, 2005