

Ning Xie

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Personal Statement

I am a PhD candidate of Computer Science & Engineering at Wright State University, Dayton OH. My research interests are broadly in machine learning, with a focus on deep learning, computer vision, and web systems modeling. I possess industry experience in neural and kernel learning methods for image processing and sequence prediction. My academic research studies deep neural network mechanisms toward *interpretability*, that aid in interpreting how they process input data in a human-understandable way. This work includes implementation, training, visualization, and analysis of convolutional neural networks using Tensorflow. I have also applied Recurrent Neural Networks via Keras to reveal latent behavioral patterns in classes of automated traffic faced by web systems.

Technical Skills

- Language: Python, C/C++, Matlab, Html, CSS, R, Java
- Frameworks & Libraries: Pytorch, TensorFlow, Keras, Caffe
- Operating Systems: Mac OS X, Linux, Windows
- Software: PyCharm, Microsoft Visual Studio, Eclipse, Matlab

Education

Ph.D. in Computer Science and Engineering

Jan. 2016 - Dec. 2020

Wright State University, GPA 4.0

Dayton, OH, USA

Selected course projects:

- Smart Cities, Devices & Methods: *Augmented Convolutional Neural Network (AUG-CNN) for Autonomous Driving*.
- Network Science: *Dynamic Social Network Analysis on Untrustworthy News Networks*.
- Machine Learning: *Did you make the Wright Choice for your College?* Using SVM to analyze college scorecard dataset public by the U.S. Department of Education.

B.S. in Pure and Applied Mathematics

Sep. 2010 - Jun. 2014

Hebei University of Technology

Tianjin, China

- National Second Prize of CUMCM (Contemporary Undergraduate Mathematics Modeling Contest)

Oct. 2013

- First-class Scholarship of the Hebei University of Technology

Nov. 2011

Professional Experience

Summer Research Intern

May 2018 - Aug. 2018

Machine Learning Department, NEC Laboratories America, Inc.

Princeton, NJ, USA

- Towards building a more transparent/explainable model on Visual Question Answering (VQA) problems. Work in progress.

Graduate Research Assistant

Jan. 2016 - Present

Kno.e.sis Center, Dept. of Computer Science and Engineering, Wright State University

Dayton, OH, USA

- Currently working on *Explainable Deep Learning for Computer Vision* via CNN visualization techniques.
- Implemented deep learning systems (LSTM-RNN) to evaluate patterns in request sequence of web robot and IoT device sessions for request prediction and traffic generation. One paper on this project has been accepted by ISNN 2017.
- Awarded two scholarships to attend events for women in computing: Ohio Celebration of Women in Computing at Lake Huron in Ohio, February 2017, and the CRA-W Grad Cohort Workshop in Washington, DC, April 2017.
- Poster presented at 2016 Women in STEMM Leadership Institute Symposium, Dayton, OH, October 2016.
- Awarded an NSF Student Fellowship to attend 12th Reasoning Web Summer School, Aberdeen, Scotland, September 2016.

Algorithm Engineer

Jun. 2014 - Dec. 2015

Tianjin Tiandy Digital Technology Co., Ltd

Tianjin, China

- Object Detection: Human gesture detection via Deformable Parts Model (DPM).
- Object Detection: Vehicle detection via artificial neural network (ANN) and support vector machine (SVM).
- Image segmentation: Improved Visual Background Extractor (VIBE) to extract ROIs effectively in complex scenarios.
- Image segmentation: Implemented Pixel-Based Adaptive segmentation (PBAS) for an intelligent transportation system project.

Publications

Xie, N., Sarker, M. K., Doran, D., Hitzler, P., & Raymer, M. (2017). "Relating Input Concepts to Convolutional Neural Network Decisions". NIPS 2017 Workshop: Interpreting, Explaining and Visualizing Deep Learning, NIPS IEVDL 2017.

Xie, N., Brown, K., Rude, N., & Doran, D. (2017, June). "A Soft Computing Prefetcher to Mitigate Cache Degradation by Web Robots". In 14th International Symposium on Neural Networks (pp. 536-546). Springer, Cham.

Sarker, M. K., **Xie, N.**, Doran, D., Raymer, M., & Hitzler, P. (2017) "Explaining Trained Neural Networks with Semantic Web Technologies: First Steps". 12th International Workshop on Neural-Symbolic Learning and Reasoning, NeSy (Vol. 17).