Zhaoyuan Fang

(574)298-8505 / zfang@nd.edu / zfang399.github.io (under construction)

EDUCATION

University of Notre Dame, Notre Dame, IN — May 2020 (expected)
Majors: Electrical Engineering & Mathematics — GPA: 3.98 / 4.0
Dean's List — All semesters, Fall 2016 – Spring 2019
Sorin Scholars Program — Spring 2017 – Present

EXPERIENCE

Carnegie Mellon University Robots Perceiving and Doing (R-PAD) Lab, Pittsburgh, PA — May 2019 – Aug 2019
Research Assistant — Advisor: Dr. David Held

- Researched possible techniques for generic single-image 6-DOF object pose estimation for completely unseen objects in the wild.
- Investigated the reasons why state-of-the-art methods fail to generalize and the impact of using synthetic data in training and testing.
- Designed and implemented a modular data loader for the *ShapeNet* dataset, speeding up the overall loading time by 30%.

The Interdisciplinary Center for Network Science & Applications (iCeNSA), Notre Dame, IN — Jan 2019 – Present
Research Assistant — Advisors: Dr. Nitesh Chawla

- Systematically investigated the possibility of using network representation learning to perform imbalance classification.
- Studied the impact of different graph constructions, random-walk schemes and sampling methods on the structure of embeddings.

Notre Dame Computer Vision Research Lab, Notre Dame, IN — Jan 2018 – Present
Research Assistant — Advisors: Dr. Adam Czajka, Dr. Kevin W. Bowyer

- Designed a novel and robust method for iris presentation attack detection with high accuracy; employed photometric stereo technique based on the observation that camera-captured 3D features of irises with and without textured contact lens are different
- Constructed computer vision based biometrics authentication systems; implemented automated multi-illumination iris image collection, presentation attack detection model, and interactive user interface; a new paper manuscript in preparation
- Explored various possibilities to detect diverse iris artifacts such as print-outs, contact lenses, prosthetic eyes and even cadaver eyes

Argonne National Laboratory, Lemont, IL — May – Aug 2018
Research Intern — Advisors: Dr. Chen Chen, Dr. Dongbo Zhao

- Developed a novel method of load identification for non-intrusive load monitoring (NILM) for better energy conservation; explored and compared multiple machine learning models; designed a new state transition classifier that boosts classification performance
- Collaborated with post-doc researchers in a load modeling project to explore new techniques for demand-side energy management

Notre Dame Distributed Cooperative Systems Research Lab, Notre Dame, IN — Aug 2018 – May 2019
Research Assistant — Advisor: Dr. Hai Lin

- Built an advanced driver-assistance system testbed based on POMDP model for prospective human-robot collaboration application
- Extended the probabilistic model learning algorithm to complex driving scenarios that closely capture variability of the real world

Notre Dame Nanophotonics Lab, Notre Dame, IN — May 2017 – May 2018
Research Assistant — Advisor: Dr. Anthony J. Hoffman

- Conducted interdisciplinary research across materials and optical science to establish the foundation for new optoelectronic devices
- Investigated fundamentally new ways to engineer the optical properties of candidate phononic materials; new paper in preparation

PREPRINTS (* indicates equal contribution)

- **Zhaoyuan Fang***, Jianren Wang*, Yongxin Wang*, Yan Xu, Hang Zhao. "FVGAN: Face and Voice Generation via Disentangled Feature Dropout." Manuscript in preparation for submission to CVPR 2020
- **Zhaoyuan Fang***, Jianren Wang*, Hang Zhao. "AlignNet: A Unifying Approach to Audio-Visual Alignment." Manuscript submitted to AAAI 2020

PUBLICATIONS (* indicates equal contribution)

- **Zhaoyuan Fang**, Dongbo Zhao, Chen Chen, Yang Li, Yuting Tian. "Non-Intrusive Appliance Identification with Appliance-Specific Networks." IEEE Industry Applications Society (IAS) Annual Meeting, Baltimore, Maryland, 2019

- Adam Czajka, **Zhaoyuan Fang**, Kevin W. Bowyer. "Iris Presentation Attack Detection Based on Photometric Stereo Features." IEEE Winter Conf. on Applications of Computer Vision (WACV), Waikoloa Village, Hawaii, 2019, **U.S. Patent pending**

- Leland Nordin, Owen Dominguez, C. M. Roberts, Will Streyer, Kaijun Feng, **Zhaoyuan Fang**, Viktor A. Podolskiy, Anthony J. Hoffman, and Daniel Wasserman. "Mid-infrared Epsilon-near-zero Modes in Ultra-thin Phononic Films." Applied Physics Letters 111:9, September 2017

HONORS & AWARDS

- Center of Career Development Pucillo Family Fund ($3,500), University of Notre Dame, 2019
- Best use of external data award, ASA DataFest 2019 at Notre Dame, University of Notre Dame, 2019
- Center for Undergraduate Scholarly Engagement (CUSE) Conference Travel Grant ($1,000), University of Notre Dame, 2019
- Tau Beta Pi (TBP) Engineering Honor Society Membership, 2018
- Eta Kappa Nu (HKN) Engineering Honor Society Membership, 2018
- Top 15%, ACM-ICPC East Central North America Regional Contest, 2018
- Top 20%, ACM-ICPC East Central North America Regional Contest, 2017
- Center for Nano Science and Technology Undergraduate Research Fellowship ($5,200), University of Notre Dame, 2017

SKILLS

Programming Language: Python, C/C++, MATLAB, ROS
Version Control: Git
Framework / Libraries: PyTorch, OpenCV
Language: English (native / bilingual), Chinese (native / bilingual)

PRESENTATIONS

- **Fang, Zhaoyuan**. "POMDP Model Learning for Human Robot Collaboration in Advanced Driver-assistance System." The 1st Annual University of Notre Dame Undergraduate Research and Experiential Learning Showcase. Nov 9th 2018, University of Notre Dame, Notre Dame, IN

- **Fang, Zhaoyuan**. "Machine Learning Applications in Appliance Identification for Non-Intrusive Load Monitoring." Argonne National Laboratory Center for Energy, Environmental, and Economic Systems Analysis Seminar Series. Aug 3rd 2018, Argonne National Laboratory, Lemont, IL

- **Fang, Zhaoyuan**. "Engineering optical modes in thin layers of epsilon-near-zero polar semiconductors." NDnano Summer Undergraduate Research Symposium. July 20th 2017, University of Notre Dame, Notre Dame, IN

LEADERSHIP & SERVICES

Vice President, Former Secretary, **IEEE Notre Dame Student Chapter,** Notre Dame, IN Sep 2016 – Present

- Coordinated and organized IEEE research fairs, guest speaker technical talks, faculty presentations and innovation nights

Vice President, **Eta Kappa Nu (HKN), Sigma Chapter,** Notre Dame, IN Jan 2019 – Present

- Coordinated and organized Electrical Engineering student to participate in group projects and community events

Co-President, **Kung Fu Club,** Notre Dame, IN Jan 2017 – Present

- Led club gatherings, collaborated with other diversity societies in promoting traditional Chinese culture, and held alumni sessions

ICPC Team Member, **ACM Notre Dame Student Chapter,** Notre Dame, IN Aug 2017 – Present

Represented the University of Notre Dame to compete in 2017 ACM-ICPC East Central North America Regional Contest

Reviewer, **IEEE Power Engineering Letters** Nov 2018 – Present

- Reviewed paper manuscripts submitted to IEEE Power Engineering Letters (PEL) related to load profile research

Reviewer, **PeerJ Computer Science** Dec 2018 – Present

- Reviewed paper manuscripts submitted to PeerJ Computer Science related to the field of Biometrics and Iris Recognition