

# ZHAOYUAN FANG

1710 N Turtle Creek Dr., South Bend, IN, 46637  
574-298-8505  $\diamond$  zfang@nd.edu  $\diamond$  zfang399.github.io

## EDUCATION

---

### University of Notre Dame

*Aug. 2016 - May 2020 (expected)*

B.S. in Electrical Engineering and Mathematics, GPA: 3.98 / 4.0

Deans List, All semesters, Fall 2016 - Fall 2019

Sorin Scholars Program, Spring 2017 - Present

GRE: 336 (verbal 166 + quantitative 170) + 4.5; TOEFL: 119

## RESEARCH EXPERIENCE

---

### Carnegie Mellon University RPAD Lab

Pittsburgh, PA

*Advisor: Dr. David Held, Dr. Hang Zhao*

*May 2019 - Aug. 2019*

- Evaluated techniques for generic 6-DoF object pose estimation for completely unseen objects in the wild; developed and implemented a modular data loader for popular object pose estimation datasets.
- Reformulated the audio-visual alignment problem and proposed an end-to-end trainable unifying solution for multiple tasks including dance-music alignment and speech-lip synchronization.

### University of Notre Dame Computer Vision Research Lab

Notre Dame, IN

*Advisor: Dr. Adam Czajka, Dr. Kevin Bowyer*

*Jan. 2018 - Present*

- Designed a robust iris presentation attack detection method; employed photometric stereo based on the difference of reconstructed 3D normal vectors of irises with and without textured contact lens.
- Constructed computer vision based biometrics authentication systems; implemented automated multi-illumination iris image collection, presentation attack detection model, and interactive user interface.

### University of Notre Dame iCeNSA

Notre Dame, IN

*Advisor: Dr. Nitesh Chawla*

*Jan. 2019 - Present*

- Systematically investigated the possibility of using network representation learning for the imbalance classification problem; studied the impact of different graph constructions, random-walk schemes and sampling methods on the separation of majority and minority embeddings.

### Argonne National Laboratory

Argonne, IL

*Advisor: Dr. Chen Chen, Dr. Dongbo Zhao*

*May 2018 - Aug 2018*

- Designed a novel load identification method for non-intrusive load monitoring (NILM) for better energy conservation; formulated a new state transition classifier that boosts classification performance
- Collaborated in a load modeling project to explore new techniques for demand-side energy management

### University of Notre Dame DISCOVER Lab

Notre Dame, IN

*Advisor: Dr. Hai Lin*

*Aug. 2018 - May 2019*

- Built a driver-assistance system testbed for prospective human-robot collaboration application.
- Extended the probabilistic model learning algorithm to complex real-world driving scenarios;

### University of Notre Dame Nanophotonics Lab

Notre Dame, IN

*Advisor: Dr. Anthony Hoffman*

*May 2017 - May 2018*

- Conducted interdisciplinary research across materials and optical science to establish the foundation for new optoelectronic device; investigated fundamentally new ways to engineer the optical properties of candidate phononic materials.

## MANUSCRIPTS

---

**Zhaoyuan Fang**, Adam Czajka, Kevin W. Bowyer. “Robust Iris Presentation Attack Detection Fusing 2D and 3D Information” Submitted to *IEEE Transactions on Information Forensics and Security (TIFS)*

## PUBLICATIONS

---

**Zhaoyuan Fang\***, Jianren Wang\*, Hang Zhao. “AlignNet: A Unifying Approach to Audio-Visual Alignment.” Accepted to *IEEE Winter Conf. on Applications of Computer Vision (WACV)*, 2020

**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*, 2019 (**Currently under review for IEEE Transaction on Industry Applications**)

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)*, 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

## GRANTS AND AWARDS

---

Center of Career Development Pucillo Family Fund \$3,500	2019
Best use of external data award, ASA DataFest 2019 at Notre Dame \$1,000	2019
Center for Undergraduate Scholarly Engagement (CUSE) Conference Travel Grant \$1,000	2019
Tau Beta Pi (TBP) Engineering Honor Society	2018
Eta Kappa Nu (HKN) Engineering Honor Society	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	2017

## SERVICES

---

**Reviewer for IEEE Power Engineering Letters** Nov. 2018 - Present  
Reviewed paper manuscripts submitted to IEEE Power Engineering Letters (PEL) related to load profile research.

**Reviewer for PeerJ Computer Science** Dec. 2018 - Present  
Reviewed paper manuscripts submitted to PeerJ Computer Science related to the field of Biometrics and Iris Recognition

## SKILLS

---

Prgramming skills: Python, C++, MATLAB, ROS,  $\text{\LaTeX}$

Version Control: Git

Framework / Libraries: PyTorch, OpenCV, NetworkX

Languages: English (fluent), Chinese (native)

## EXTRACURRICULAR

---

President of Notre Dame Kung Fu Club	2017-2019
Vice President of IEEE Delta Sigma Chapter	2018-2019
Vice President of IEEE Eta Kappa Nu (HKN) Honor Society Delta Sigma Chapter	2018-2019