

# Zhaoyuan Fang

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

## EDUCATION

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**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

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**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)

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- **Zhaoyuan Fang\***, Jianren Wang\*, Hang Zhao. "AlignNet: A Unifying Approach to Audio-Visual Alignment." Manuscript submitted to WACV 2020

## PUBLICATIONS (\* indicates equal contribution)

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- **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**

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- 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**

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**Programming Language:** Python, C/C++, MATLAB, ROS

**Version Control:** Git

**Framework / Libraries:** PyTorch, OpenCV

**Language:** English (native / bilingual), Chinese (native / bilingual)

## **PRESENTATIONS**

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- **Fang, Zhaoyuan.** “POMDP Model Learning for Human Robot Collaboration in Advanced Driver-assistance System.” The 1<sup>st</sup> Annual University of Notre Dame Undergraduate Research and Experiential Learning Showcase. Nov 9<sup>th</sup> 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 3<sup>rd</sup> 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 20<sup>th</sup> 2017, University of Notre Dame, Notre Dame, IN

## **LEADERSHIP & SERVICES**

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- 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