ZHAOYUAN FANG

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EDUCATION

Carnegie Mellon University *Aug. 2020 - Aug. 2022 (expected)*
M.S. in Robotics

University of Notre Dame *Aug. 2016 - May 2020*
B.S. in Electrical Engineering and Mathematics, GPA: 3.98 / 4.0 (*summa cum laude*)
Dean's List, All semesters
Sorin Scholars Program

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 - Aug. 2020*

- 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 - Jan. 2020*

- 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 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*, Aidan Boyd*, Adam Czajka, Kevin W. Bowyer. "Iris Presentation Attack Detection: Where are we Now?" Submitted to *Pattern Recognition Letters*

PUBLICATIONS

Zhaoyuan Fang, Adam Czajka, Kevin W. Bowyer. "Robust Iris Presentation Attack Detection Fusing 2D and 3D Information" In *IEEE Transactions on Information Forensics and Security (T-IFS)*, 2020

Zhaoyuan Fang, Adam Czajka. "Open Source Iris Recognition Hardware and Software with Presentation Attack Detection." *IEEE International Joint Conference on Biometrics (IJCB)*, 2020

Jianren Wang, **Zhaoyuan Fang**. "GSIR: Generalizable 3D Shape Interpretation and Reconstruction" *European Conference on Computer Vision (ECCV)*, 2020

Zhaoyuan Fang*, Jianren Wang*, Hang Zhao. "AlignNet: A Unifying Approach to Audio-Visual Alignment." *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 (Accepted to 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

The Basil R. Myers Award for outstanding Engineering graduate	*2020*
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
Reviewer for PeerJ Computer Science

SKILLS

Prgramming skills: Python, C++, MATLAB, LaTeX
Version Control: Git
Framework / Libraries: PyTorch, OpenCV, NetworkX
Languages: Engligh (fluent), Chinese (native)

EXTRACURRICULAR

President of Notre Dame Kung Fu Club	*2017-2020*
Vice President of IEEE Delta Sigma Chapter	*2018-2019*
Vice President of IEEE Eta Kappa Nu (HKN) Honor Society Delta Sigma Chapter	*2018-2019*