

ZHAOYUAN FANG

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EDUCATION

Carnegie Mellon University
M.S. in Robotics

Aug. 2020 - Aug. 2022 (expected)
GPA: 4.08 / 4.0

University of Notre Dame
B.S. in Electrical Engineering and Mathematics
Dean's List, All semesters
Sorin Scholars Program

Aug. 2016 - May 2020
GPA: 3.98 / 4.0 (*summa cum laude*)

RESEARCH EXPERIENCE

Carnegie Mellon University Fragkiadaki Lab
Advisor: Dr. Katerina Fragkiadaki

Pittsburgh, PA
Aug. 2020 - Present

- Developed a framework for an embodied agent to self-improve its object detector in 2D and 3D through motion and mapping without any human supervision.
- Implemented methods for flow estimation, tracking, transformer-based detection and segmentation

Carnegie Mellon University RPAD Lab
Advisor: Dr. David Held, Dr. Hang Zhao

Pittsburgh, PA
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
Advisor: Dr. Adam Czajka, Dr. Kevin Bowyer

Notre Dame, IN
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.

Argonne National Laboratory
Advisor: Dr. Chen Chen, Dr. Dongbo Zhao

Argonne, IL
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
Advisor: Dr. Anthony Hoffman

Notre Dame, IN
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.

PUBLICATIONS

(* indicates equal contribution)

Zhaoyuan Fang^{*}, Ayush Jain, Gabriel Sarch, Adam W. Harley, Katerina Fragkiadaki. “Move to See Better: Self-Improving Embodied Object Detection” In British Machine Vision Conference (BMVC), 2021

Aidan Boyd^{*}, **Zhaoyuan Fang**^{*}, Adam Czajka, Kevin W. Bowyer. “Iris Presentation Attack Detection: Where are we Now?” In *Pattern Recognition Letters (PRL)*, 2020

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

Priyanka Das^{*}, Joseph Mcgrath^{*}, **Zhaoyuan Fang**^{*}, *etal.* “Iris Liveness Detection Competition (LivDet-Iris) – The 2020 Edition” *IEEE International Joint Conference on Biometrics (IJCB)*, 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

Jianren Wang^{*}, **Zhaoyuan Fang**^{*}, 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

AWARDS

The Basil R. Myers Award for outstanding Engineering graduate	2020
Center of Career Development Pucillo Family Fund	2019
Best use of external data award, ASA DataFest 2019 at Notre Dame	2019
Tau Beta Pi (TBP) Engineering Honor Society	2018
Eta Kappa Nu (HKN) Engineering Honor Society	2018
Center for Nano Science and Technology Undergraduate Research Fellowship	2017

SERVICES

Reviewer for T-PAMI, ICRA 2021, BMVC 2021, ICRA 2022, CVPR 2022

SKILLS

Programming skills: Python, C++, MATLAB, L^AT_EX

Version Control: Git

Framework / Libraries: PyTorch, OpenCV, NetworkX

Languages: English (fluent), Chinese (native)