
Research Interests

Robot Perception, Computer Vision, Computational Imaging, Machine Learning

My work focuses on utilizing low-level techniques from computational imaging to improve robot perception. I am particularly interested in using raw time-of-flight information from miniature 3D time-of-flight sensors to enable improved robot perception and understanding.

Education

2020-Present **University of Wisconsin - Madison: PhD Computer Science**
Advisors: Michael Gleicher, Mohit Gupta

2020-2022 **University of Wisconsin - Madison: M.S. Computer Science**

Graduated 2020 **Drury University: B.S. Computer Science**
Minor: Mathematics | GPA: 3.99

Experience

Aug. 2022 **Graduate Research Assistant: Visual Computing Lab / Wision Lab**
to present University of Wisconsin - Madison

Summer 2022 **Machine Vision Research Intern**
CyberOptics (now Nordson) | Minneapolis, MN

- Developed deep learning-based semantic segmentation model for fast automatic segmentation of printed circuit boards
- Method was later used to significantly improve performance of height reconstruction algorithm in challenging scenarios

Aug. 2020 **Graduate Teaching Assistant**
to May 2022 University of Wisconsin - Madison

- Computer Graphics (Fall 2021, Spring 2022)
- Grader for Computer Vision (Fall 2021, Fall 2022)
- Intro to Programming (Fall 2020, Spring 2021)

Summer 2019 **NSF Research Experience for Undergraduates**
University of Missouri - Columbia

- Developed integrated system for collection of depth video
- Adapted action recognition neural network to newly gathered field data

Summer 2018 **Software Intern**
Cerner (now Oracle) | Kansas City, MO

- Created React-based web interface to replace desktop-based physician portal

Publications

- 2024 F. Mu*, **C. Sifferman***, S. Jungerman, Y. Li, M. Han, M. Gleicher, M. Gupta, Y. Li. [Towards 3D Vision with Low-Cost Single-Photon Cameras](#). *Computer Vision and Pattern Recognition (CVPR) 2024*.
- 2024 Y. Wang, **C. Sifferman**, M. Gleicher. [IKLink: End-Effector Trajectory Tracking with Minimal Reconfigurations](#). *International Conference on Robotics and Automation (ICRA) 2024*.
- 2023 **C. Sifferman**, Y. Wang, M. Gupta, M. Gleicher. [Unlocking the Performance of Proximity Sensors by Utilizing Transient Histograms](#). *Robotics and Automation Letters (RA-L)*. To appear: *International Conference on Robotics and Automation (ICRA) 2024*.
- 2023 Y. Wang, **C. Sifferman**, M. Gupta, M. Gleicher. [Exploiting Task Tolerances in Mimicry-based Telemanipulation](#). *International Conference on Intelligent Robots and Systems (IROS) 2023*.
- 2022 **C. Sifferman**, D. Mehrotra, M. Gupta, M. Gleicher. [Geometric Calibration of Single-Pixel Distance Sensors](#). *Robotics and Automation Letters (RA-L)*. In *Proceedings International Conference on Intelligent Robots and Systems (IROS)*, 2022.
- 2019 Z. Moore, **C. Sifferman**, S. Tullis, M. Ma, R. Proffitt, M. Skubic. [Depth Sensor-Based In-Home Daily Activity Recognition and Assessment System for Stroke Rehabilitation](#). *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, 2019.

Selected Achievements / Awards

- 2024-26 NSF NRT Integrate Fellowship
- 2024 McPherson Eye Research Institute Walsh Travel Award
- 2021 CS Departmental Summer Research Assistantship (UW-Madison)
- 2020 CS Departmental First Year Scholarship (UW-Madison)
- 2019 Phi Kappa Phi Honor Society (Drury University)
- 2017 Judge Warren White Scholarship (Drury University)
- 2017 Outstanding Freshman in Computer Science (Drury University)

Mentoring

- 2024 Akash Deepak | Hardware Design for Robotics and Imaging
- 2024 Jonathan Wang | Firmware for optical ToF Sensors
- 2023 Kwasi Debrah-Pinamang | Mobile Robot Sensing, Mapping, and Control
- 2023 Prannav Arora | Mobile Robot Sensing, Mapping, and Control
- 2023 Ben Weinstein | Hardware Design for Distributed Robot Sensing
- 2022-23 Pittawat Sawatyanon | Firmware for Low Level Access to optical ToF Sensors

Other Service

- 2021-23 Volunteer Tour Guide & Mentor for Prospective CS Graduate Students – UW-Madison
- 2019 Volunteer Referee – FIRST Robotics Competition
- 2017-2020 New Student Orientation Leader – Drury University

Skills

Programming: Python (PyTorch, NumPy, Pandas), Neural Scene Reconstruction (e.g. NeRF), Differentiable Rendering, ROS, ROS 2, Java, MATLAB, GLSL

Web: JavaScript (React, Three.js), HTML, CSS, WebGL

Tools: Unix, Git, LaTeX, Docker, Photoshop, Illustrator, Inkscape, GIMP