cpsiff.github.io
/in/cpsiff
/cpsiff

CARTER SIFFERMAN

Madison, WI
sifferman@wisc.edu
(417) 234-1832

Research Interests

My research lies at the intersection of **computer vision**, **imaging**, and **robotics**. My goal is to create novel sensing systems based on time-of-flight sensors. In addition to solving general imaging problems like 3D reconstruction and tracking, I design robotics systems which use novel sensing algorithms for things like obstacle avoidance, navigation, and safe human-robot interaction.

Education

University of Wisconsin - Madison: PhD Computer Science **2020-Present**
Advisors: Michael Gleicher, Mohit Gupta
Expected Graduation: Spring 2026 (Flexible)

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

Drury University: B.S. Computer Science **2016**
Minor: Mathematics | GPA: 3.99

Experience

University of Wisconsin - Madison **Aug. 2022 - Present**
Graduate Research Assistant: Visual Computing Lab / Wision Lab Madison, WI

- Research areas: computer vision, imaging, and robotics (see publications)
- Managed and led research projects for 2-3 undergraduate researchers per semester

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

- Created deep learning-based method for improving accuracy of recovered PCB height maps
- My work was used to significantly improve performance of automatic PCB inspection

University of Wisconsin - Madison **2020-22**
Graduate Teaching Assistant Madison, WI

- TA for Computer Graphics (F ‘21, S ‘22)
- Grader for Computer Vision (F ‘21, F ‘22)
- TA for Intro to Programming (F ‘20, S ‘21)

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

- Developed self-contained hardware system for offline capture of depth data
- Developed and evaluated system for automatic assessment of stroke patient recovery

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

- Created React-based web interface for physician data entry

Publications

C. Sifferman, W. Sun, M. Gupta, M. Gleicher. Using a Distance Sensor to Detect Deviations in a Planar Surface. Robotics and Automation Letters (RA-L). To Appear: International Conference on Robotics and Automation (ICRA) 2025.

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*. **[* Equal contribution]**

Y. Wang, **C. Sifferman**, M. Gleicher. IKLink: End-Effector Trajectory Tracking with Minimal Reconfigurations. *International Conference on Robotics and Automation (ICRA) 2024.*

C. Sifferman, Y. Wang, M. Gupta, M. Gleicher. Unlocking the Performance of Proximity Sensors by Utilizing Transient Histograms. *Robotics and Automation Letters (RA-L). In Proceedings: International Conference on Robotics and Automation (ICRA) 2024.*

Y. Wang, **C. Sifferman**, M. Gupta, M. Gleicher. Exploiting Task Tolerances in Mimicry-based Telemanipulation. *International Conference on Intelligent Robots and Systems* (*IROS) 2023.*

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.

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. **[* Equal contribution]**

Selected Achievements / Awards

NSF Research Traineeship Program “INTEGRATE” Fellowship	2024-26
UW-Madison CS Department Summer Research Assistantship	2021
UW-Madison CS Department First Year Scholarship	2020-21

Invited Talks

MIT Media Lab, Camera Culture Group. *Imaging with Miniature Time-of-Flight Sensors.* October 2024.

NASA Goddard Space Flight Center, Robotics Lunch Discussion. *3D Robot Sensing with Miniature Time of-Flight Sensors.* August 2024.

SONY Research Award Program. *Novel Applications of Miniature Time-of-Flight SPADs.* April 2024.

Technical Skills

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

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