cpsiff.github.io
/in/cpsiff
/cpsiff

CARTER SIFFERMAN

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Research Interests

Robot Perception, Computer Vision, Computational Imaging

My work focuses on utilizing low-level techniques from computational imaging to improve robot perception. I am interested in novel sensors, particularly optical time-of-flight sensors, to enable distributed, up-close, and closed-loop robot sensing.

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

Summer 2022 **Machine Vision Research Intern**
CyberOptics | Minneapolis, MN

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

Aug. 2020 to May 2022 **Graduate Teaching Assistant**
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 | Kansas City, MO

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

Publications

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

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

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

2021-2022 Dev Mehrotra | Characterization and Development of 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), ROS, ROS 2, Java, MATLAB, GLSL

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

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