Matthew Sivaprakasam

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Education

B.S. | Computer Engineering
University of Pittsburgh

- Expected graduation: April 2022
- Overall GPA: 3.7
- In-major GPA: 3.9
- Minor: Biomedical Engineering
- Certificate in Innovation, Product Design, and Entrepreneurship

Skills

Programming Languages
Proficient
Python • Matlab • Java
Some Experience
C++ • HTML • MIPS Assembly

Development/Frameworks
PyTorch
OpenCV
Arduino
User-centered Design
ROS
Tensorflow
Agile/Scrum

Miscellaneous
Music Recording/Performance
Pro Tools
CPR certified

Coursework

Engineering
Computer Vision
Machine Learning
Signals and Systems Analysis
Linear Control Systems
Art of Making (Design course)
Quant. Systems Neuroscience

Independent Study
Motion Planning for Self-Driving Cars (Coursera)
Google Machine Learning Crash Course

Experience

AirLab | Research Intern
Pittsburgh, PA | June 2020 - Present

- PI: Dr. Sebastian Scherer
- Division of the Field Robotics Center at Carnegie Mellon University
- Improving standard path-planning methods by incorporating learned models that predict obstacle-interactions
- Set up planning framework on top of Hybrid A* and validated in simulation and on a physical platform

M*Modal | Software Engineering Co-op
Pittsburgh, PA | May 2019 - December 2020

- Applied state-of-the-art NLP techniques towards enhancing clinical software
- Pre-trained a language model using a Reformer (more-efficient Transformer), and fine-tuned to predict diagnosis codes from large sets of clinical documents
- Developed a QA tool that generates text by incorporating various medical terms/concepts and checks that our service understands them in the right context

NSF-SHREC | Research Intern
Pittsburgh, PA | May 2020 - August 2020

- Worked on a project in Airsim that involves using reinforcement learning to teach a drone to locate and travel to specified objects in an unknown environment

Human Engineering Research Laboratories | Research Intern
Pittsburgh, PA | June 2018 - August 2020

- Helped process and analyze IMU data taken from wheelchair users to find new metrics for evaluating user performance
- Project earned 2nd place in the Randall Family Big Idea Competition

Projects

Indy Autonomous Challenge (ongoing)

- Motion Planning subteam lead - in charge of researching, implementing, and testing planning algorithms before integrating them into our stack
- Programming an autonomous racecar that will compete against other cars in a high-speed race on the Indianapolis Motor Speedway
- Competing as a member of the Pitt Robotics and Automation Society team

Person-tracking for Tello drone

- Perception and high-level control system for drone to detect,track, and follow a person with onboard camera (demo visible at pitt.edu/~mjs299)
- Established subject visibility metrics based on keypoints on your body predicted using Google's Posenet
- Metrics are fed into PID controller to calculate motion commands

Publications/Presentations

Improving Off-road Planning Techniques with Learned Costs from Physical Interactions

- M. Sivaprakasam, S. Triest, W. Wang, P. Yin, S. Scherer. *International Conference on Robotics and Automation,2021* **(in submission)**