Anthony Nguyen

anthonyn2121@gmail.com | (717) 575-0382 | LinkedIn | GitHub

Professional Experience

Jacobs | Autonomy Engineer **June 2021 - Present**

- Led the development of teaming and behavior planning algorithms for a fleet of UAVs, effectively demonstrating the decomposition of high-level mission plans into individual UAV tasking, enhancing mission efficiency and adaptability.
- Collaborated with engineers at GTRI and UDRI to create a subsystem to interface with an onboard AngryKitten pod to control sensors autonomously to keep targets in field of view.
- Developed and deployed a sophisticated task planning framework utilizing OMS/UCI standards, leveraging on-track error analysis and priority assignment. This system effectively orchestrates UAV tasking and re-tasking processes, ensuring mission plan execution

Vijay Kumar Lab at UPenn | Graduate Research Assistant & Robotics Engineering Intern **Aug 2019 - May 2021**

- Improved the lab's drone swarm demo by installing a radio communication protocol and also designed propellor guards unique to each drone for better detection that allowed the lab to fly a swarm up to 10 drones
- Benchmarked various off-the-shelf VIO algorithms against a collected dataset that included fast, aggressive flight images and IMU measurements using ROS. The result of this study was used to decide and compare algorithms to use online quadrotor swarm localization

The Applied Research Lab | Engineering Intern **June 2018 - Sep 2019**

- Automated post-test data analysis by writing a MATLAB script to perform necessary calculations to find temperature profile of heat exchanger and review the data during meetings
- Calculated cold-side temperatures through known hot-side temperatures of heat exchangers to find power generated as a function of time

Skills

Software: Python, MATLAB, Simulink, Modern C++, Arduino, Linux OS, Git
Technologies: PyTorch, Sklearn, Docker, Jenkins, CSWA SolidWorks Certified, Experience in Agile/Scrum environment
Strengths: Oral & Written Communication, Self-starter, Strong Work Ethic, Reliable & Consistent

Education

University of Pennsylvania, School of Engineering & Applied Science **May 2021**
Master of Science in Engineering (MSE) in Mechanical Engineering and Applied Mechanics
Master's Independent research: A study and benchmark of SOTA VIO algorithms using the UZH FPV Drone Racing Dataset
Coursework: Advanced Robotics, Learning for Robotics (Sensor fusion, Motion Planning, Deep RL), Applied Machine Learning, Machine Perception, Mechatronics, Optimal Nonlinear Control, Probability & Statistics

The Pennsylvania State University, College of Engineering **May 2019**
Bachelors of Science in Mechanical Engineering
Cumulative GPA: 3.73/4.00 | Awards: Schuman Scholar, Member of Tau Beta Pi Honors Society
Elective Coursework: Writing as a Professional Engineer, Vehicle Dynamics, Mechatronics, Intro to Robotics

Projects

Autonomous Navigation and Control of a Quadrotor

- Wrote a Geometric Nonlinear PD Controller for the Crazyflie 2.0 quadrotor. This controller points the z-axis (normal to body) to the desired direction for thrust application. This allows for fast, aggressive flight plaths.
- Given a map, a path is first created from a known starting and goal position using A* and then a trajectory is generated using splines

Data Driven Self-Driving Car

- Using public datasets, I trained a custom ResNet-18 network on RGB camera images to predict steering wheel angle of a car in real time. The RMSE obtained on my test set of images was 0.065
- Tested the model in real time by driving a simulated car and observing if the car can correct itself with accumulation of steering error. Report and video of training pipeline and simulation can be seen at https://github.com/anthonyn2121/steering_angle_prediction

Quaternion-Based UKF for Orientation Tracking

- Implemented a computationally effective, robust, accurate orientation tracking of a quadrotor using IMU data with absence of a magnetometer
- UKF is enhanced to handle constraints of unit quaternions, resulting in a less than 0.3 error from ground truth