Wichayut Lertkittiamornkul

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EDUCATION

Bachelor of Science in Aerospace Engineering
The Pennsylvania State University: University Park, *May 2021 – May 2025 (GPA: 3.90/4.00)*

EXPERIENCE

ARI LAB PENN STATE
GNC Undergraduate Researcher, *March 2025 – Present*

- Developed a non-linear MPC controller for agile quadrotor flight with solver optimization achieving sub-10 ms solve times at 100+ Hz control rate using ACADOS
- Tested and validated the non-linear MPC controller in a ROS + Gazebo simulation with a PX4 SITL
- Developed reusable shebang and setup scripts to standardize ROS and Python environment initialization, enabling faster and more consistent onboarding across the team

APUS LAB PENN STATE
AI/ML Undergraduate Researcher, *Sep 2023 – Sep 2024*

- Designed a custom architecture inspired by GANs to tackle complex unsupervised learning problems in PyTorch
- Optimized machine learning algorithms, reducing run time by over 50%
- Leveraged CUDA to perform parallel processing on large data sets, accelerating model training
- Integrated surrogate modelling techniques to decrease computational cost while maintaining high accuracy
- Developed and implemented reinforcement learning algorithms enabling autonomous drones to mimic expert behavior

PROJECTS

AUTONOMOUS FIRE-EXTINGUISHING QUADROTOR

- Led the software team in the planning, development, and implementation of the drone's software in C++, while closely collaborating with the hardware team to ensure seamless software-hardware integration
- Developed a custom quadrotor simulation in Python to test autonomous navigation algorithms, flight control algorithms, control architecture, and sensor fusion algorithms in a physics-based environment
- Implemented a quaternion-based attitude controller to improve maneuverability and prevent gimbal lock, ensuring stable flight control
- Designed an optimal search pattern to efficiently locate a heat source while minimizing flight time and energy consumption

QUADROTOR REINFORCEMENT LEARNING

- Developed a custom quadrotor OpenAI Gym environment for seamless integration with established reinforcement learning libraries, ensuring compatibility and ease of implementation within RL pipelines
- Integrated MuJoCo with the custom quadrotor OpenAI Gym environment, enabling high-fidelity dynamics and realistic quadrotor motion
- Implemented 3D visualization using MuJoCo's rendering engine, enabling real-time simulation playback for analyzing agent behavior and debugging RL models
- Trained agents using proximal policy optimization (PPO), leveraging Stable-Baselines3 for policy optimization and performance evaluation

SKILLS

- Computer Programming (Python, C++, MATLAB)
- 3D Modelling & Simulation (SolidWorks, Star CCM+)
- ML/AI (PyTorch, CUDA, Scikit-learn, Pandas)
- Software Development (Git, Shell/Bash)
- Embedded (ROS, Linux, KiCad)
- Product Development (CONOPS, PDR/CDR, Risk Assessment, Stakeholder Analysis)
- Project Management (GANTT, MS Project)