Jagadeswara Pavan Kumar Varma Pothuri

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Education

University at Buffalo **Expected Dec 2024**

Master of Science in Robotics, GPA: 4.0/4.0 *Buffalo, NY*

Relevant Coursework

Robotic Algorithms	Machine Learning	Optimization	Learning for Autonomous Systems
Control Systems	Probability	Deep Learning	Computer Vision & Image Processing

Technical Skills

Programming Languages: Python, C++, MATLAB, C

Software & Tools: ROS, PX4, ArduPilot, AirSim, Unreal Engine, Gazebo

Algorithms: Reinforcement Learning, SLAM, Path Planning, Computer Vision

Hardware: TurtleBots, Jetson Nano, Raspberry Pi, Intel RealSense D435i, Pi Cameras

Additional Skills: AI Integration, Autonomous Systems, Sensor Fusion, Hardware Design & Prototyping

Projects

A Physical–Digital Twins Environment for Real Outdoor Testing of Multi-Unmanned Aerial Vehicle Coordination and Applications *(Python, Pymavlink, Olympe, Airsim, Pixhawk)* *ICRA 2025 (Submitted)*

- Developed and validated a robust framework for testing multi-UAV coordination algorithms in outdoor environments, utilizing custom drones equipped with PX4, ArduPilot firmware, and Parrot Anafi drones, eliminating reliance on advanced motion capture systems.
- Created a medium-fidelity digital twin using Microsoft AirSim and Unreal Engine, accurately simulating UAV operations in a netted outdoor flight facility, and implemented coverage path planning algorithms.
- Successfully deployed the digital twin in real-world hardware environments, aligning simulated and actual UAV trajectories for scalable coverage path planning and multi-robot task allocation algorithms.

Autonomous UAV Tracking and Pursuit using Reinforcement Learning *(Python, C++, ROS2, TensorRT)*

- Developed a real-time UAV localization and tracking system using YOLOv11 integrated with Reinforcement learning (PPO), incorporating probabilistic filters to handle uncertainty and correlation filters for precise object tracking
- Deployed on a custom drone with ArduPilot firmware, tested with Jetson Orin Nano and a D435i depth camera, achieving over 90% detection success and reducing the average distance to the target to under 10 meters.

Experience

Graduate Research Assistant, ADAMS Lab **June 2023 – Present**

University at Buffalo *Buffalo, NY*

- Developed UAV systems utilizing PX4, ArduPilot, Jetson Nano & Orin Nano, and Raspberry Pi (3, 4, and 5), integrating advanced autonomous control solutions.
- Collaborated on the development of multi-UAV coordination algorithms, focusing on task allocation, coverage planning, path planning, and autonomous navigation systems.
- Worked with ground robots like TurtleBots, enhancing real-time sensor fusion for autonomous operations.
- Trained and mentored 4 undergraduate students in UAV development, covering drone assembly, programming, and control.

Software Developer **Nov 2020 – Dec 2022**

TCS Deccan Park *Hyderabad, India*

- Designed and implemented an NLP-powered recommendation system, improving support ticket triage efficiency by 30%.
- Managed SSO (SAML2, OAuth2) for 700+ enterprise applications, achieving 100% incident resolution and service ticket management, while expediting application integration with enterprise-wide SSO in under a year.
- Recognized as Employee of the Month three times and received two Best Team Awards for outstanding performance.

Publications

An Open-Source Hardware/Software Architecture and Supporting Simulation Environment to Perform Human FPV Flight Demonstrations for UAV Autonomy. DOI: 10.2514/6.2024-4458, **AIAA AVIATION FORUM 2024**