Jagadeswara Pavan Kumar Varma Pothuri

Robotics PhD Student · Aerial Autonomy · Robot Perception · Active Mapping · University at Buffalo

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Robotics PhD student building autonomy that runs on real UAVs, from GPS-free visual tracking on a Crazyflie to multimodal active mapping in field studies. First-author **Best Student Paper**, AIAA AVIATION 2025. Seeking a **robotics research internship**.

Research areas: aerial autonomy · robot perception · active mapping · multimodal sensing · vision-based control · reinforcement learning · sim-to-real transfer · multi-robot coverage planning · field robotics · hardware-in-the-loop simulation

Current directions: energy-aware multirotor planning, world models, physics-informed learning, diffusion and VLA policies.

EDUCATION

Ph.D., Computer Science & Engineering, Robotics — 2025 to Present
University at Buffalo, SUNY · DRONES Lab, advisor Dr. Karthik Dantu

M.S., Robotics · GPA 4.0 / 4.0 — 2023 to 2025
University at Buffalo, SUNY · ADAMS Lab, advisor Dr. Souma Chowdhury

B.Tech, Electronics & Communication Engineering · GPA 9.05 / 10 — 2016 to 2020
JNTU Kakinada, India

RESEARCH EXPERIENCE

Graduate Research Assistant · DRONES Lab — 2025 to Present
University at Buffalo · advisor Dr. Karthik Dantu

- Exploring world models and learned dynamics for prediction and planning on UAVs, with a focus on policies that transfer from simulation to real hardware.
- Early work on **physics-informed** models of quadrotor dynamics for data-efficient, dynamically grounded control.

Graduate Research Assistant · ADAMS Lab — 2023 to 2025
University at Buffalo · advisor Dr. Souma Chowdhury

- **Vision-based aerial autonomy, first author, AIAA 2025:** trained a camera-only reinforcement-learning velocity controller in AirSim and deployed it sim-to-real on a Crazyflie with no GPS; one UAV actively tracks another using an efficient detector for target state estimation, beating a tuned PID baseline on tracking up-time and stand-off accuracy.
- **Multi-UAV coverage planning, SCoPP, JCISE 2026:** co-developed a scalable coverage-path planner that partitions non-convex survey areas with no-fly zones and load-balances workload across up to 150 UAVs; field-validated on a post-flood survey.
- **Open-source flight-demo platform, AIAA 2024:** contributed quadrotor flight-dynamics modeling to an F450 / Pixhawk FPV platform and a matching hardware-in-the-loop AirSim / Unreal digital twin for real-to-sim capture of human flight demonstrations.
- **Systems & field work:** PX4 / ArduPilot on Pixhawk and Jetson; ROS 2, MAVROS; flight tests with Crazyflie and Parrot Anafi. TA, MAE 550 Optimization in Engineering Design.

PROFESSIONAL EXPERIENCE

Software Developer · Tata Consultancy Services — 2020 to 2022
Hyderabad, India · 3× "Best Employee of the Month"

- Built ML-driven IT-operations tooling: a recommendation engine that cut ticket resolution time **35%** and a forecasting dashboard covering **500+** applications at **92%+** accuracy.

PUBLICATIONS

1. P. KrisshnaKumar, J. Witter, L. Collins, **J. P. K. V. Pothuri**, P. Ghassemi, E. T. Esfahani, K. Dantu, S. Chowdhury. "Efficient Planning for Scalable and Load-Balanced Area Coverage by Multiple UAVs." *ASME J. Computing and Information Science in Engineering*, vol. 26, no. 9, 2026. **DOI**
2. **J. P. K. V. Pothuri**, A. Bhatt, P. KrisshnaKumar, M. Oddiraju, S. Chowdhury. "A Learning Approach to Efficient Vision-Based Active Tracking of a Flying Target by a UAV." *AIAA AVIATION Forum*, 2025. **arXiv**
   ★ **Best Student Paper, AIAA Intelligent Systems Student Paper Competition, AIAA AVIATION 2025**
3. H. Xiao, P. KrisshnaKumar, **J. P. K. V. Pothuri**, P. Soni, E. Butcher, S. Chowdhury. "An Open-Source Hardware/Software Architecture and Simulation Environment for Human FPV Flight Demonstrations for UAV Autonomy." *AIAA AVIATION Forum*, 2024. **arXiv**

TECHNICAL SKILLS

Languages	Python, C++, CUDA, MATLAB, Bash
Learning for Control	deep RL, imitation learning, physics-informed learning, sim-to-real transfer, domain randomization, transformers / VLMs
Dynamics, Control & Planning	6-DOF rigid-body dynamics, Newton-Euler modeling, system identification, nonlinear control, MPC, PID, trajectory optimization, motion & coverage path planning, Nav2
Perception & Estimation	object detection, visual tracking, target state estimation, SLAM, visual-inertial odometry, sensor fusion, OpenCV
Robotics & Hardware	ROS 2, PX4 / ArduPilot, MAVROS / MAVLink, NVIDIA Jetson, Pixhawk, Crazyflie, Intel RealSense, LiDAR, IMU / GPS-RTK
Simulation & Tools	AirSim, Gazebo, MuJoCo, PyBullet, Unreal Engine, Isaac Sim, hardware-in-the-loop; PyTorch, Docker, Git, TensorRT / ONNX, SLURM / HPC, Weights & Biases