Phani Kiran V

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Engineer with 5+ years of industrial experience in robotics, autonomous systems, embedded software, and aerospace engineering. Skilled in path planning, control, simulation, dexterity, and AI/ML for robotic applications

EDUCATION

2024 - Present	MS in Mechanical - Robotics Specialization	Northwestern University	3.92/4.0
2014 - 2019	Bachelor's and Master's in Aerospace Engineering	Indian Institute of Technology, Kharagpur	3.83/4.0

Relevant Coursework: Robotic Manipulation, Robot Design, ML, DL, Generative AI, Active Learning, Parallel Computing

SKILLS

Programming: C | C++ | Python | Assembly | PASCAL
Libraries: ROS | Numpy | Pytorch | HPP | OpenMP | MPI
Tools: Matlab | Git | Gazebo | Drake | CMake
Others: Linux | LaTeX| Docker

WORK EXPERIENCE

Graduate Research Assistant | CRB, Northwestern University **Jan'25 – Present**
- Built a digital twin of bimanual dexterous robot in Drake, modeling joint position controller, camera, and tactile sensor
- Integrated Drake with ROS2 to enable teleoperation using haptic gloves for robot control and VR headset for visualization
- Accelerated data collection using hardware-in-loop and applied domain randomization for improved simulation co-training

Robotics Software Engineer | Airbus (Bangalore, India) **Oct'22 – Aug'24**
- Contributed to 4 Humanoid Path Planner libraries by fixing intermittent controller–state machine communication issue
- Developed Inverse Kinematics (IK) planner for aircraft surface inspection application and demonstrated it on UR10e robot
- Optimized IK planner using Traveling Salesman for waypoint sequencing and joint space constraints to limit unsafe motions
- Led path planning team of 7 people within Airbus Robotics; published whitepaper "Motion Planning for Industrial Robots"

Avionics Software Engineer | Airbus (Bangalore, India) **July'19 – Sep'22**
- Improved operational margins of aircraft warning system, extending lifespan to support 3–5 years of critical developments
- Introduced custom warning mechanism to detect systems with mismatched part numbers, reducing false in-flight alerts
- Built an automated code generation toolchain, reducing lead time by 70% while adhering to Airbus quality standards

Autonomy Intern | Boeing (Bangalore, India) **May'18 – Jul'18**
- Created hybrid path planner for drone navigation by combining A* for planning and Potential Field for obstacle avoidance
- Performed software-in-loop simulations in Gazebo using PX4 for drone control across dynamic obstacle environments

Research Intern | Indian Institute of Science **May'17 – Jul'17**
- Developed a neuro-adaptive controller with dynamic inversion, adhering to thruster constraints for high-altitude vehicle
- Evaluated controller robustness in simulation, achieving 98% efficacy with up to 50% random variations in parameters

RELEVANT PROJECTS

Control of Robotic Hand **Jan'25 – May'25**
- Implemented and tested cascaded PD control on tendon-driven robotic hand with wrist, forearm and two fingers
- Integrated joint encoders, characterized series elastic actuators for force feedback, and controlled motors using ODrives

Predator Prey Pursuit in Land Terrains **Jan'25 – Mar'25**
- Modeled predator-prey pursuit in gridworld using partially observable MDP for prey planning and A* for predator tracking
- Conducted simulation study to analyze impact of terrain structure and predator motion uncertainty on prey survival rates

Planning and control of youBot 13DOF mobile manipulator **Nov'24 – Dec'24**
- Simulated a pick-and-place operation in CoppeliaSim using a task-space planner combined with feedback PD controller
- Incorporated singularity avoidance by enforcing joint limits and dynamically constraining the manipulator jacobian

Obstacle Avoidance in 3D using Dubins and RRT* **Jul'18 – May'19**
- Devised a novel approach to combine two 2D planar Dubins maneuvers generating optimal path between two points in 3D
- Integrated RRT* planner using Dubins as steering method, resulting in curvature-constrained collision-free trajectories

ACHIEVEMENTS/EXTRACURRICULARS

- Received quarterly and spot award for significant contribution to projects and adhering to Airbus values
- Built a RC car with ultrasonic-based collision avoidance using RPi at an overnight hackathon at Carnegie Mellon University
- Recipient of 9th and 10th Boeing - IIT Kharagpur university relations scholarship, awarded by Boeing