Kailash Jagadeesh

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Education:

Carnegie Mellon University — **Pittsburgh, PA**
Masters in Robotic Systems Development | GPA: 4.04/4.0 — *Aug 2024 - Present*
Relevant Coursework: *Optimal Control&Reinforcement Learning, Learning for 3D Vision, Robot Autonomy.*
Graduate Teaching Assistant - *Sensing and Sensors (16-722) , Cognitive Robotics (15-494)*

National Institute of Technology Trichy(NITT) — **Trichy, India**
Bachelor's in Mechanical Engineering | GPA: 8.69/10 — *Aug 2018 - June 2022*

Skills:

Languages: Python, Bash, C/C++, CAN access Programming Language (CAPL), Arduino
Frameworks: ROS2, Gazebo, MuJoCo, IssacSim, PyTorch, OpenCV, MATLAB, Solidworks, Siemens NX, Vector CANoE, Ansys Workbench, LTSpice, Zuken E3, Picoscope, AWS
Engineering Skills: Design Verification Plan, Design Failure Mode-Effect Analysis, Root Cause Analysis

Work Experience:

Advanced Semiconductor Materials Lithography (ASML) — **Wilton, CT**
Robotics/Mechatronics Engineer Intern — *May 2025 - Aug 2025*
- Diagnosed and modeled sensor drift in a robotic end-effector by analyzing time-series data and designing experiments to characterize drift behavior under varying operational conditions.
- Engineered health monitoring algorithms to detect and predict actuator brake system failures, enhancing system reliability and maintenance efficiency.
- Conceptualized a multi-agent coordination framework for a novel planar reticle handler, optimizing operational throughput and precision.

Tekkotsu lab - Carnegie Mellon University — **Pittsburgh, PA**
Graduate Research Assistant — *Dec 2024-May 2025*
- Designed and developed abstraction layers for finite state machine models and control algorithms, including **extended Kalman filter-based SLAM** and RRT-based planners, to enhance robotics education and navigation in VEX V5 robots.
- Contributed to robotics research and education initiatives, improving tools for STEM programs.

Ola Electric Mobility — **Bangalore, India**
Assistant Manager- Electrical and Electronics Systems Engineer — *June 2022 - May 2024*
- Designed and developed the electrical architecture for **5 production vehicle models** currently on the road, led **system requirements** definition and **system integration** for seamless vehicle performance.
- Devised cost-saving initiatives for components like throttle system, ESCL, and seat latch, reducing costs by **5% of electrical system cost** while conducting endurance and automated tests for e-Scooter platforms.
- Engineered M1 roadster's (e-bike) powertrain control system and collaborated on **in-house ABS system** development and constructed custom test benches for component-level testing.
- Benchmarked and defined the **sensor suite** for **L2.5 ADAS** requirements for E4W project; drafted the electrical architecture based on **FuSA requirements (ISO-26262)** and defined the compute requirements.

Projects:

Multi-Agent Collaborative Manipulators for Quality Inspection — CMU | *Sep 2024 - Present*
- Developed and implemented dual-arm motion planning framework using ROS2 and MoveIt2 for a Kinova Gen3 robotic system, enabling coordinated Cartesian and joint-space planning with TRAC-IK kinematics solver under a shared controller architecture.
- Integrated real-time 3D reconstruction for inspection tasks within a bimanual manipulation pipeline, optimizing trajectory execution and system modularity for multi-robot configurations.

Augmenting Learned Centroidal Controller with Adaptive Force Control — CMU | *Feb 2025- May 2025*
- **Enhanced robustness of legged robot locomotion** by integrating an L1 adaptive control layer into the CAJun framework's low-level QP controller, achieving improved stability and consistent performance under varying inertial parameters and payload conditions.
- **Benchmarked reinforcement learning–based centroidal control policies** across simulation environments (Isaac Gym→MuJoCo) to identify sim-to-sim transfer limitations, and demonstrated that the adaptive control augmentation significantly improved jumping distance and resilience to model uncertainties.

Vision-Guided Robotic Fencing System — CMU | *Feb 2025 - April 2025*
- Developed a vision-guided robotic fencing system using a Franka Panda arm and RGB-D sensing, implementing HSV-based color segmentation, extrinsic calibration, and a real-time planning pipeline to mirror and counter human attacks.
- Designed and evaluated a finite state machine for human-robot interaction, enabling responsive defensive maneuvers with ~165 ms latency and demonstrating robust trajectory mirroring for dynamic fencing scenarios.

Achievements and Publications:

- **K. Jagadeesh*** and N. Hemangani, "SR (Supernumerary Robotic) Fingers," 7th International Conference on Computing in Engineering & Technology (ICCET 2022), Online Conference, 2022, pp. 217-221, doi:10.1049/icp.2022.0621.
- **Jagadeesh, K.** (2024). Development and Optimization of Automotive Testing Using Machine Vision. In: Bandyopadhyay, S., Balas, V.E., Biswas, S.K., Saha, A.K., Thounaojam, D.M. (eds) Intelligent Computing Systems and Applications. ICICSA 2023. Lecture Notes in Networks and Systems, vol 1010. Springer, Singapore. doi: 10.1007/978-981-97-5412-0_18