Aravind S

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Education

- **Indian Institute of Science, Bangalore** *Expected Graduation in July 2024*
  Master of Technology in Robotics and Autonomous Systems CGPA: 9.2
- **PES University, Bangalore** *2018-2022*
  Bachelor of Technology in Electronics and Communication Engineering CGPA: 9.29

Projects

- **Self-balancing robot using LQR based feedback control**
  - Implemented a LQR based controller on a two wheeled self balancing robot. Simulation and hardware implementations were performed and verified
- **Robust Control on a Drone**
  - Designed and implemented a UDE based robust control for position and attitude control on a quadrotor. Hardware implementation of attitude control was performed and verified.
- **Deep RL based control for a quadrotor**
  - Implemented deep reinforcement learning based position and attitude control for a quadrotor. Performed simulations using the PyBullet simulator to train and verify the controller.
- **Study of Average Reward TRPO for infinite horizon control problems**
  - Studied and implemented a paper on average reward variant of the Trust Region Policy Optimization algorithm. Performed rigorous analysis and verified results on different infinite horizon control problems through simulations.
- **Design of a Funnel Controller for given STL specifications**
  - Implemented a formally guaranteed funnel controller for an omnibot such that it obeys given spatio-temporal specifications. Verified the controller through Gazebo simulations and hardware implementation.
- **Multi-Agent Surveillance over large graphs**
  - Working on designing and developing a scalable deep reinforcement learning algorithm to perform surveillance over large graphs using multiple agents.

Experience

- **Nokia Solutions & Networks Pvt Ltd | Student Intern** *Jul 2021 – Dec 2021*
  Manyata Tech Park, Bangalore
  - Worked on companion computer adaptation to change in flight controller for drones used in Nokia Drone Networks.
- **NVIDIA Graphics Pvt Ltd | Hardware Intern** *Jan 2022 – Jul 2022*
  Manyata Tech Park, Bangalore
  - Worked on report generation for GPU Performance tests. Required to design and write highly optimized, scalable, and maintainable code to generate HTML reports. Also worked on the UI for the HTML reports. Worked on optimizing C++ build time of projects in Windows and Linux.
- **MathWorks Pvt Ltd | Engineer in Engineering Development Group** *Aug 2024 – Present*
  Embassy Tech Village, Bangalore
  - Developed an Intelligent Bin Picking system using ROS2 with a UR5e robotic arm, enhancing robotic perception and manipulation.
  - Enabled MATLAB and Simulink interface with the Crazyflie drone using Crazyradio, facilitating real-time control and simulation for research and development.

Publications

- N. H. G, A. S, L. Jayanti and P. Tallapragada, "Reinforcement Learning Based Persistent Surveillance on Graphs Under Energy Constraints," 2024 Tenth Indian Control Conference (ICC), Bhopal, India, 2024, pp. 532-537, doi: 10.1109/ICC64753.2024.10883706.

Skills

Reinforcement Learning, Design of Control Systems, Arduino programming, Drone Computing, Robot Operating System [ROS and ROS2], Gazebo Simulation, Embedded Systems, Android App Development Using Kotlin, OpenCV, MATLAB, Simulink, Pytorch, Python, C, JAVA, Kotlin, Embedded C, C++, Perl, HTML, CSS, JavaScript, Team Management, Project Management

Positions of Responsibility

- **Captain -** Team Aeolus, PES University *June 2020 – August 2021*
- **Robotics Mentor -** PES Innovation Lab, PES University *May 2020 – Sept 2020*
- **Teaching Assistant -** PES University *Jan 2022 – May 2022*
  - Worked as Teaching Assistant for Robotics Systems course. Designed and corrected assignments involving ROS and Gazebo using robots like drones, cars, robotic arms etc.
- **Teaching Assistant -** Indian Institute of Science, Bangalore *Aug 2023 – Dec 2023*
  - Worked as Teaching Assistant for the Foundations of Robotics course. Designed and corrected assignments on different topics like rotation matrices, manipulator kinematics and dynamics.