ASHVIN N IYER

669-252-9726 | ashvin.iyer@gmail.com | github.com/ashviniyer21 | linkedin.com/in/ashvin-iyer

EDUCATION

Purdue University - B.S. in Computer Science, Minor in Mathematics *August 2021 - December 2024*

GPA: 3.91/4.0

Courses: Motion Planning (Grad), Computational Optimization (Grad), Reinforcement Learning (Grad), Robotics, Artificial Intelligence, Machine Learning, Data Structures, Advanced Algorithms, Numerical Methods, Operating Systems

EXPERIENCE

Robotics Software Engineer Intern - Kodiak Robotics *Sep 2023 - Dec 2023 / May 2024 - Aug 2024*

- Added noise injection and scenario modification of log-based simulations to provide larger coverage of realistic simulations.
- Increased simulation support for all modules, and optimized evaluation of generated plans to enable large-scale testing.
- Improved performance of generated plans in imperfect conditions (i.e. missing data) through enhanced obstacle avoidance.

Embedded Software Engineer Intern - Amazon *May 2023 - Aug 2023*

- Extended bluetooth functionality to enable phone calling across multiple connected phones from one audio device.

Student Researcher - IDEAS Lab (Dr. Aniket Bera) *Jan 2024 - May 2024*

- Implemented a low-level planner to convert a cartesian velocity to a series of gait trajectories on a quadruped robot.
- Explored methods for heterogeneous robot collaboration via latent space planning to simplify information exchange.

Student Researcher - CoRAL Lab (Dr. Ahmed Qureshi) *May 2022 - May 2023*

- Developed novel method efficient multi-agent exploration using Reinforcement Learning. Work published to IROS 2023.
- Original policy trained in simulation environment, deployed in real world experiment using sim-to-real methods.

PROJECTS / COMPETITIONS

Purdue Lunabotics - Software Lead *August 2021 - May 2023*

- Lead group of 15+ members to 6th place overall and 3rd for autonomy in the 2023 NASA Lunabotics competition.
- Estimated robot and obstacle positions via Depth Cameras and IMUs with Point-cloud Processing and Kalman Filtering.
- Navigated robot using graph-based path planning (D*) and optimization-based path following (Model Predictive Control).

Motion Planning with IL and RL

- Implemented methods for combining imitation learning and reinforcement learning for robot manipulation tasks.
- Improved upon existing methods by adding self-generated demos and enabling RL exploration around IL distribution.

Robotics Algorithms

- Rewriting classical robotics algorithms to enhance my understanding, including A*, RRT*, MPC, EKF, ICP, and more.

Robot Chess Player

- Used external camera and apriltags to perform frame conversion from chess board location to robot-relative coordinates.
- Implemented inverse kinematics and visual servoing (using Yolov5) for 6-dof robot arm to pick and place chess pieces.

Drone Video

- Collaborated with teammates to place 2nd in the science category in the Purdue Undergraduate Research Exposition.
- Improved object following of moving rover with drone using Kalman Filtering on single-frame detections for predictions.

PUBLICATIONS

Xuyang Chen*, **Ashvin N Iyer***, Zixing Wang, Ahmed H Qureshi, *"Efficient Q-Learning over Visit Frequency Maps for Multi-agent Exploration of Unknown Environments"*, IROS 2023 [arXiv]

SKILLS

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

Libraries / Tools: Git, Linux, Vim, Numpy, Boost, Eigen, Pytorch, OpenCV, ROS, Mujoco, Matplotlib, Bazel, Conda