

Adil Shiyas

Education

adilshiyas@gmail.com | (508)-365-7029 | Worcester, MA | website | github

Worcester Polytechnic Institute

Master of Science in Robotics Engineering | GPA: 3.8

Aug 2024 - May 2026

Worcester, MA

PES University

Bachelor of Technology in Mechanical Engineering

Aug 2017 - June 2021

Bangalore, India

Experience

Graduate Researcher – ELPIS Lab, Worcester Polytechnic Institute

May 2025 – May 2026

Principal Investigator: Professor Constantinos Chamzas

Worcester, MA

- Developed a motion planning framework for robotic manipulation under continuous goal regions, enabling constant-time trajectory retrieval through offline precomputation and online adaptation; validated in MuJoCo and on a real UR10 robot.
- Ported MotionBenchMaker from ROS1 (C++) to a Python-based framework using Pinocchio, Coal, and OMPL, eliminating simulator overhead and enabling scalable benchmarking of motion planners across multiple manipulators and environments.

Research Associate – International Institute of Information Technology - Bangalore (IIIT-B)

Oct 2022 – June 2024

Principal Investigator: Professor Sachit Rao

Bangalore, India

- Formulated geometric and temporal constraints on a consensus-based multi-robot controller and solved for controller parameters in MATLAB to generate collision-free trochoidal trajectories; validated on an indoor mobile robot platform and scaled to 12 simulated agents.
- Developed a decentralized reciprocal collision avoidance controller based on collision cones, enabling reactive multi-robot navigation using local state information while mitigating deadlocks and oscillations.

Projects

Linear Model Predictive Control for Dynamic Obstacle Avoidance

May 2026 - Jun 2026

- Implemented a constrained linear MPC in C++ for UR10 trajectory tracking in MuJoCo by optimizing joint accelerations through quadratic programming.
- Formulated soft dynamic obstacle avoidance constraints within the MPC while enforcing joint acceleration and velocity limits.

Actor-Critic Reinforcement Learning for Robotic Manipulation

Jan 2025 – Mar 2025

- Implemented actor-critic RL algorithms (DDPG, A3C) in PyTorch for continuous control of a KUKA manipulator in PyBullet.
- Implemented experience replay, target networks, and asynchronous parallel workers to train and evaluate reinforcement learning policies for object manipulation.

Action Chunking Transformer for Vision-Based Robotic Peg Insertion

Feb 2025 – Apr 2025

- Implemented the Action Chunking Transformer (ACT) in PyTorch for vision-based imitation learning on a UR10 peg insertion task using RGB images and robot state observations.
- Developed a demonstration collection pipeline with scripted expert policies and randomized initial conditions to train transformer-based action chunking policies.

Task and Motion Planning Framework for Manipulation

Apr 2026 – May 2026

- Developed a ROS 2 task and motion planning package integrating PDDL, Fast Downward, and MoveIt 2.
- Implemented C++ ROS 2 nodes with MoveIt Task Constructor and OMPL to execute symbolic task plans for the Tower of Hanoi problem on a simulated Franka Emika Panda.

Skills

Programming: Python, C++17, MATLAB | **Robotics:** OMPL, MoveIt 2, ROS 2, Pinocchio | **Libraries:** PyTorch, OpenCV |

Simulation: MuJoCo, Genesis, PyBullet | **Tools & Systems:** Linux, Simulink, Blender, Fusion 360

Publications

COAD: Constant-Time Planning for Continuous Goal Manipulation with Compressed Library and Online Adaptation

Adil Shiyas, Zhuoyun Zhong, Constantinos Chamzas.

Under Review at *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2026. [arXiv]

Design of Planar Collision-Free Trochoidal Paths for a Multi-Robot Swarm

Adil Shiyas, Sachit Rao

European Journal of Control, Vol. 81, 2025. [ScienceDirect]

Reciprocal Collision Avoidance in Non-holonomic Robots using Collision Cones

Adil Shiyas, Sachit Rao

2025 Eleventh Indian Control Conference (ICC) [IEEEExplore]