Prasham Patel

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EDUCATION

Worcester Polytechnic Institute (WPI) — **Worcester, MA**
Master's in Robotics Engineering (Ongoing) — **GPA:** 4.0/4.0 — May 2023

- **AI** (GitHub)**:** Hill-climbing, Genetic Algorithm, Regression, and deep-learning
- **Control Algorithm** (GitHub)**:** State-feedback, feedback linearized, Robust, Adaptive, and Impedance Controller
- **Motion Planning** (GitHub)**:** A*, RRT*, Informed RRT*, D* and Sampling-based planner
- **Manipulators Dynamics** (GitHub)**:** Recursive Newton-Euler, Numerical Inverse-Dynamics Algorithms

Nirma University — **Ahmedabad, India**
Bachelor's in Mechanical Engineering — **GPA:** 7.57/10.0 — May 2021

- Control Theory, Machine Dynamics & Kinematics, Introduction to Robotics, Machine Design, Electrical Technology

KEY SKILLS

- **Programming Languages:** C++, Python, Rust, MATLAB, Shell script, Linux
- **Tools:** GitHub, ROS, Gazebo, Simulink, CMake
- **Framework:** OpenCV, TensorFlow, Keras, PCL, Sci-Kit Learn, Matplotlib
- **Hardware:** Raspberry-Pi 4B, Nvidia Jetson Nano, Arduino Mega & Uno

PROFESSIONAL EXPERIENCE

Robotics Software Development Intern (On Going) — **Brookfield, CT**
Target Arm, Inc. (Website) — May 2022

- Developed sliding mode controller to follow minimum jerk trajectory for Quadcopters.
- Designed a Kalman Filter to fuse Vision Estimates with time-of-flight sensor.
- Took initiative to automate data logging and visualization pipeline to create PDF report in python.
- Performed Socket and Asynchronous programming in Rust and C++.

Robotics Lab, Nirma University (Website) — **Ahmedabad, India**
ROBOCON Team Member — Oct 2017 – Feb 2020

- Designed wheeled mobile robots and mechanisms actuated by motors and pneumatic pistons.
- Implemented PID based geometric controller for trajectory tracking in embedded C.
- Lead Team of 20 in Junior Year; Won ROBOCON National Championship with team in 2018 against 115 engineering colleges and 1st runners-up in 2019 against 84 engineering colleges, represented India at International level.

Autonomous Quadruped Robot ROBOCON 2019 (Video) — Aug 2018 – Jun 2019

- Developed pneumatic piston powered 4-legged robot with frog-like gait controlled by ATMEGA 328.
- Implemented Polynomial Regression Learning Based Controller to control actuation time of pneumatic piston with MATLAB.

ACADEMIC PROJECTS

Motion Planning: Overtaking and Crossroad Collision Avoidance (Paper, GitHub) — Jan 2022 – May 2022

- Devised Minimum acceleration trajectory based RRT* and integrated it with Velocity Obstacle method.
- Simulated in CARLA Python for overtaking and avoiding collision at crossroad.
- Designed a Stanley Controller for trajectory tracking.

Reinforcement Learning based Controller for 2-link Manipulator (GitHub) — Jan 2022 – May 2022

- Developed Reinforcement learning model to control joint torque to achieve and maintain end-effector pose.
- Training and Testing environment created in Python SciPy ODE-45.

Adaptive and State-Feedback Controller for Quadcopter (Paper, GitHub) — Aug 2021 – Dec 2021

- Simulated Quadcopter with erroneous dynamics to follow cubic trajectory.
- Analyzed system performance on Gazebo environment and on MATLAB ODE 45.

Autonomous Quadrotor UAV (Video, GitHub) — Jan 2021 – May 2021

- Designed Feedback Linearized controllers for autonomous take-off, landing, and gliding.
- Created Object detection and monocular visual odometry pipeline on Raspberry Pi 4B using Open CV.

PAPERS AND PUBLICATIONS

- Contact force modelling for wheeled mobile robots in MATLAB-SIMULINK (Paper)
- Geometric Controller for Synchronous Drive robot (Paper)