

# Srijal Shekhar Poojari

Embedded Systems · Robotics · Controls

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## EDUCATION

### UNIVERSITY OF MARYLAND

M.S. in Systems Engineering (Control Systems) · GPA 4.0/4.0

- Advisor: Dr. Derek A. Paley
- Thesis: *ReZoom: A self-driving electric scooter*

College Park, USA

2021–2023

### SARDAR PATEL INSTITUTE OF TECHNOLOGY | UNIVERSITY OF MUMBAI

B.E. in Electronics Engineering · GPA 8.49/10

- Capstone: *Design of Tethered Multirotor System for High Payload Applications*

Mumbai, India

2015–2019

## APPOINTMENTS

### ROBOTICS AND AUTONOMY LAB

Graduate Research Assistant · 1 year 2 mos. (ongoing)

- Leading the development of autonomous e-scooters with Prof. Derek Paley.
- Development of state estimation, planning, navigation and control of the e-scooter using the Robot Operating System (ROS) is ongoing work. [Some present results ▶]

College Park, USA

2021–

### SP PRODUCT DEVELOPMENT CELL

Research Associate · 1 year

- Worked on industry consultancy projects with Prof. R. R. Sawant and Prof. Y. S. Rao.
- Developed robust embedded software for Microchip dsPIC, TI C2000, and Microchip ATmega family of microcontrollers.
- Implemented the above with high power driver circuits for sensorless (no encoder) brushless and brushed DC motor control using back EMF sensing.
- Developed a 4.5 kW (135V, 35A) battery charger for the Indian Railways with run time short circuit recovery, earth fault detection and other protections.

Mumbai, India

2019–2020

### DRISHTI WORKS

Robotics Engineer Intern · 2 mos.

- Developed the sensing, power distribution and IMU system for AURUS, a beach cleaning robot.
- Implemented a fault-tolerant communication pipeline between the computing stack and hardware stack using ROS.

Mumbai, India

2018

### FRACTAL ANALYTICS

Project Intern · 1 mo.

- Developed applications using Unity (C#) on the Microsoft HoloLens Mixed Reality (MR) headsets for displaying statistical results in the form of interactive holograms.

Mumbai, India

2017

## INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY

Summer Intern · 3 mos.

Mumbai, India

2017

- Created self-reconfigurable robot modules inspired by the Dttto Modular Robot.
- Developed virtual simulations of the same modules on V-REP (now CoppeliaSim) with bluetooth control.

## SELECT PROJECTS



### PROJECT ATLAS

B.E. Capstone Project · 9 mos.

Mumbai, India

2018–2019

- Built a *tethered* multirotor with an All Up Weight (AUW) of 10 Kgs.
- Designed fully custom 140V to 32V@20A step-down switching converters, at a high frequency of 855kHz, for a small form-factor and low weight. [Report ]
- Second place across all undergraduate departments for Technical Paper Presentation.

### ROOM OCCUPANCY INDICATING SYSTEM

B.E. Semester VI Project · 3 mos.

Mumbai, India

2018

- Created a network of small (3"x3") wireless sensors to detect human presence in a office room, across multiple such rooms.
- Developed PCBs and 3D printed cases to integrate low power sensing and wireless communication across multiple devices placed in different rooms of an office space. [Report ]

### EYANTRA ROBOTICS COMPETITION

All-India Robotics Competition · First Place · 5 mos.

Mumbai, India

2016–2017

- First place amongst 162 teams across India.
- Led a team of 4 in implementing algorithms for localization and motion planning of a Firebird V robot.
- Used OpenCV with Python for processing images of the arena to detect and distinguish shapes, areas and colors of objects for the given challenge. [Demo Video ]

### CYKLO

Startup · 1 year 6 mos.

Mumbai, India

2015–2017

- Led hardware development at CYKLO, a point-to-point bicycle sharing service, started in 2015 at SPIT, Mumbai.
- Designed, built and programmed several hardware prototypes for the automated cycle locking system - including the locking mechanism, electronic controller and network interface.
- First place and award of INR 300,000 in InterThrone 2017 for the automated cycle locking prototypes.

## OTHER AWARDS AND HONORS

2022      First place (Mad Scientist) for best overall design in IEEE USA R2 Brown Bag - Analog and Digital Circuit Design.

- 2016 First place in department level Circuit Troubleshooting Competition at undergraduate institute.
- 2016 Second place out of 459 entries in the Arduino All-The-Things Contest on Instructables for my project called "The Companion IC" [↗](#).
- 2015 First place in CodeChamps, a programming competition for all freshman students at my undergraduate institution. Used C++.

## TEACHING EXPERIENCE

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### **DYNAMICS OF AEROSPACE SYSTEMS**

Graduate Teaching Assistant

College Park, USA

2021

- Teaching Assistant for ENAE 301: Dynamics of Aerospace Systems, taught by Prof. Derek Paley.
- Responsibilities include conducting recitations, office hours and grading for 80 students.

### **SIGNAL PROCESSING ON DSPs**

Instructor

Mumbai, India

2019

- Invited for workshops to train faculty on incorporating embedded Digital Signal Processor (DSP) development boards in their curriculum at three institutes of the University of Mumbai: K.J. Somaiya, MPSTME and AIKTC.

### **ROBOTIC VISION**

Undergraduate Teaching Assistant

Mumbai, India

2019

- Teaching Assistant for ETRX OE2: Robotic Vision, taught by Prof. K.T. Talele
- Responsible for designing, conducting and instructing lab sessions for a batch of about 20 students.

### **MULTIPLE WORKSHOPS ON EMBEDDED SYSTEMS DEVELOPMENT**

Instructor

Mumbai, India

2016–2019

- Conducted four workshops titled "Embedded Systems Design", "Microcontrollers, Sensors and Arduino", "ESP8266 and MQTT" and "PCB Making and Robotic Systems" throughout my undergraduate years.
- Instructed about 15 to 30 students in the above workshops spanning 2 days each.

## OTHER ACTIVITIES

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- 2022 Facilitator for the Maryland LEAD Program for two semesters [↗](#).
- 2021 Graduate Innovation Fellow [↗](#).
- 2018 Student Technical Committee Member in Circuit Troubleshooting Event 2018 at Sardar Patel Institute of Technology.
- 2018 Certified on edX for course Robotics: Fundamentals [↗](#).
- 2016 Participated in workshop on MSP-FPGA Hardware and Software Co-design.