# Vishal Gupta

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## EDUCATION

**Arizona State University** **Expected May 2024**
Master of Robotics & Autonomous Systems (Electrical Engineering Major) GPA: 4.00/4.00
Relevant Course: Affine Geometry & Kinematics, Computer Architecture II, Linear System Theory, Optimal Controls, Robotics-II

**Indian Institute of Technology Bombay** **June 2022**
P.G Part-time, Department of Systems & Control Engineering
Relevant Course: Analytic & Geometric Dynamics, Mathematical Structures for Systems & Control

**University of Mumbai** **July 2018**
Bachelor of Engineering (Electronics Engineering Major)
Relevant Course: Robotics, Artificial Intelligence, Principle of Control Systems, Signals & Systems GPA: 7.52/10

## PROFESSIONAL EXPERIENCE

**Embedded & Real-Time Systems (ERTS) Lab, IIT Bombay** **December 2018 - July 2022**
**Sr Project Technical Assistant** Mumbai, India

- Developed more than eight robotics & RTOS applications under supervision and collaboration with Prof Kavi Arya, CSE Dept, IIT Bombay, to conceptualize 3 different teaching pedagogy.
- Led a team of 6 in design & development of UGV (with UR5 mount) & drones (Quadcopters & Octocopters).
- Coached undergraduate students through designing & managing international robotics competitions, (eYRC) eYantra Robotics Competition. Curated three editions in year 2019, 2020 & 2021 with 3675, 1771 & 897 students respectively.
- Created MOOCs in ROS & AVR microcontrollers, drone simulation models in Gazebo & real applications for teaching & research purposes, with yearly 4000+ participants.
- Mentored 14 interns in various robotics projects in an annual internship program at ERTS Lab.
- Fortified auto-grading Python scripts for efficient analysis and evaluation of 1000+ bag(log) files containing extensive telemetric data for system's performance analysis.
- Developed & facilitated 2-day workshops on topic "Introduction to Embedded Systems". Trained 180+ college faculties from 65+ engineering colleges across India.

## WORK EXPERIENCE

**Graduate Teaching Assistant,** School of Electrical, Computer & Energy Engineering, ASU **January 2024 - May 2024**

- Mentoring 21 undergraduate students in embedded control systems lab experiments for course EEE304: Signals & Systems-II.

**Graduate Service Assistant,** Secure, Trusted, and Assured Microelectronics Center, ASU **January 2023 - November 2023**

- Trained to implement research methodology on, graphical algorithm accelerators, and geometric-algebra accelerators.

**Graduate Service Assistant,** School of Manufacturing Systems & Network, ASU **January 2023 - May 2023**

- Upheld utilitarian teaching support for 63 senior students with programming, designing & debugging using 16-bit PIC controller for course- EGR314: Embedded System Design.

## TECHNICAL SKILLS

**Programming Languages:** Python, Embedded C, C, PLC, Bash, Verilog
**Hardware architecture:** AVR, ARM, PIC, STM32, Cylone V GX FPGA
**Software & Frameworks:** ROS/ROS2, Point-Cloud-Library, Netlogo, STM32Cude IDE, Linux/Unix
**Tools & simulators:** Gazebo, MATLAB, Simulink, CoppeliaSim-VREP, Ki-CAD, Eagle, GitHub

## PROJECTS

**Higher DOF Kinematics using Clifford Algebra|** ASU, Independent Research **December 2023 - March 2023**

- Built and simulated an Arbiter PUF using RTL techniques, leveraging delay differences in multiplexers to create unique responses for various challenges and devices.

**Optimal Trajectory Control of a Quadcopter |** ASU, Course- Optimal Control **February 2023 – April 2023**

- Deliberated & implemented optimal control methods for trajectory control of a quadcopter using PID & LQR controller for a 3DOF linearized model in ROS-Gazebo.

**Novozymes Enzyme Stability Prediction** | ASU, Course- Machine Learning on FPGA **September 2022 - November 2022**

- RNN-LSTM model with R2 94% accuracy score, for predicting thermal stability of amino acids sequential data.

**Agribot|** ERTS Lab, IIT Bombay **August 2021 – December 2021**

- Bolstered distant hands-on learning for 40+ students, with Sahayak Bot in greenhouse using ROS-multisystem & cloud-VPN.

**Accelerated 3D-Perception** | ERTS Lab, IIT Bombay **June 2021 - June 2022**

- Curated a filtering pipeline for 3D camera, leveraging Point Cloud Library, concatenated with CNN model for object recognition.
- Alleviated price & energy requirements by implementation on Xilinx's Ultra96 MPSoC using Vivado HLS language.

**Sahayak Bot |** ERTS Lab, IIT Bombay **August 2019 - August 2020**

- Constructed a ground-vehicle with UR5 manipulator, both actual & simulation models for generic autonomous pick-&-place and navigation applications, to facilitated teaching 5446 students challenges associated with industrial robotics to date.