

# Vishal Gupta

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## EDUCATION

<b>Arizona State University</b> Master of Robotics & Autonomous Systems (Electrical Engineering Major) Relevant Course: ML Deployment on FPGA, Computer Architecture II, Applied Linear Algebra, Optimal Controls, Robotics-II	<b>Expected May 2024</b> GPA: 4.00/4.00
<b>Indian Institute of Technology Bombay</b> P.G Part-time, Department of Systems & Control Engineering Relevant Course: Analytic & Geometric Dynamics, Mathematical Structures for Systems & Control	<b>June 2022</b>
<b>University of Mumbai</b> Bachelor of Engineering (Electronics Engineering Major) Relevant Course: Robotics, Artificial Intelligence, Principle of Control Systems, Signals & Systems	<b>July 2018</b> GPA: 7.52/10

## PROFESSIONAL EXPERIENCE

<b>Embedded &amp; Real-Time Systems (ERTS) Lab, IIT Bombay</b> <b>Sr Project Technical Assistant</b>	<b>December 2018 - July 2022</b> Mumbai, India
<ul style="list-style-type: none"><li>Developed more than eight robotics &amp; RTOS applications under supervision and collaboration with Prof Kavi Arya, CSE Dept, IIT Bombay, to conceptualize 3 different teaching pedagogy.</li><li>Led a team of 6 in design &amp; development of UGV (with UR5 mount) &amp; drones (Quadcopters &amp; Octocopters).</li><li>Coached undergraduate students through designing &amp; managing international robotics competitions, (eYRC) eYantra Robotics Competition. Curated three editions in year 2019, 2020 &amp; 2021 with 3675, 1771 &amp; 897 students respectively.</li><li>Created MOOCs in ROS &amp; AVR microcontrollers, drone simulation models in Gazebo &amp; real applications for teaching &amp; research purposes, with yearly 4000+ participants.</li><li>Mentored 14 interns in various robotics projects in an annual internship program at ERTS Lab.</li><li>Fortified auto-grading Python scripts for efficient analysis and evaluation of 1000+ bag(log) files containing extensive telemetric data for system's performance analysis.</li><li>Developed &amp; facilitated 2-day workshops on topic "Introduction to Embedded Systems". Trained 180+ college faculties from 65+ engineering colleges across India.</li></ul>	

## WORK EXPERIENCE

<b>Graduate Teaching Assistant</b> , School of Electrical, Computer & Energy Engineering, ASU	<b>January 2024 - May 2024</b>
<ul style="list-style-type: none"><li>Mentoring 21 undergraduate students in embedded control systems lab experiments for course EEE304: Signals &amp; Systems-II.</li></ul>	
<b>Graduate Service Assistant</b> , Secure, Trusted, and Assured Microelectronics Center, ASU	<b>January 2023 - November 2023</b>
<ul style="list-style-type: none"><li>Trained to implement research methodology on, graphical algorithm accelerators, and geometric-algebra accelerators.</li></ul>	
<b>Graduate Service Assistant</b> , School of Manufacturing Systems & Network, ASU	<b>January 2023 - May 2023</b>
<ul style="list-style-type: none"><li>Upheld utilitarian teaching support for 63 senior students with programming, designing &amp; debugging using 16-bit PIC controller for course- EGR314: Embedded System Design.</li></ul>	

## TECHNICAL SKILLS

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

## PROJECTS

<b>Ring Oscillator PUF (Physical Unclonable device) design</b>   ASU, Course- CEN598	<b>September 2023 - September 2023</b>
<ul style="list-style-type: none"><li>Built and simulated an Arbiter PUF using RTL techniques, leveraging delay differences in multiplexers to create unique responses for various challenges and devices.</li></ul>	
<b>Optimal Trajectory Control of a Quadcopter</b>   ASU, Course- Optimal Control	<b>February 2023 – April 2023</b>
<ul style="list-style-type: none"><li>Deliberated &amp; implemented optimal control methods for trajectory control of a quadcopter using PID &amp; LQR controller for a 3DOF linearized model in ROS-Gazebo.</li></ul>	
<b>Novozymes Enzyme Stability Prediction</b>   ASU, Course- Machine Learning on FPGA	<b>September 2022 - November 2022</b>
<ul style="list-style-type: none"><li>RNN-LSTM model with R2 94% accuracy score, for predicting thermal stability of amino acids sequential data.</li></ul>	
<b>Agribot</b>   ERTS Lab, IIT Bombay	<b>August 2021 – December 2021</b>
<ul style="list-style-type: none"><li>Bolstered distant hands-on learning for 40+ students, with Sahayak Bot in greenhouse using ROS-multisystem &amp; cloud-VPN.</li></ul>	
<b>Accelerated 3D-Perception</b>   ERTS Lab, IIT Bombay	<b>June 2021 - June 2022</b>
<ul style="list-style-type: none"><li>Curated a filtering pipeline for 3D camera, leveraging Point Cloud Library, concatenated with CNN model for object recognition.</li><li>Alleviated price &amp; energy requirements by implementation on Xilinx's Ultra96 MPSoC using Vivado HLS language.</li></ul>	
<b>Sahayak Bot</b>   ERTS Lab, IIT Bombay	<b>August 2019 - August 2020</b>
<ul style="list-style-type: none"><li>Constructed a ground-vehicle with UR5 manipulator, both actual &amp; simulation models for generic autonomous pick-&amp;-place and navigation applications using SLAM, to facilitated teaching 5446 students challenges associated with industrial robotics to date.</li></ul>	