Mustafa Bhadsorawala

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EDUCATION

New York University *May 2023*
Master of Science, Mechatronics, Robotics and Automation 3.75
Specialization: Mobile Robotics
Reinforcement Learning | Localization and Navigation | Advanced Mechatronics

K.J Somaiya College of Engineering *May 2017*
Bachelor of Engineering, Mechanical Engineering 3.4
Machine Design | Theory of Machines | Robotics

EXPERIENCE

Graduate Teaching Assistant, Mechatronics, Controls, and Robotics Lab | New York, NY *Feb 2023 – Present*
Designed controllers for laboratory experiments using MATLAB and Simulink for, engineering applications e.g., maglev

- Delivered lectures and led laboratory sessions, providing hands-on experience with traditional controllers, PID, LQR

Robotics Project Engineering Intern, Amazon Robotics | Seattle, WA *Jun 2022 – Aug 2022*
Supported deployment of robots and their infrastructure at Amazon Sort Center

- Developed and documented a process for robotics floor expansion joint validation, improving time efficiency by 56%
- Supported KUKA robot setup for package entry stations, performed calibration and validation of perception systems

Production/Operations Engineer, Baari Labs | Indore, India *Oct 2019 – Jan 2021*
Managed the operations of a 3D printing startup, production, and development

- Managed 3D printing production and inventory, led project to develop automated data logging software resulting in a 20% reduction in failure rate
- Worked with clients on new product development, consulting on design process and manufacturing feasibility
- Oversaw design and prototype of UV-C disinfection chamber delivered within a 6-week timeline during the pandemic
- Trained people in 3D printing and CAD design, built processes to track maintenance, production, inventory, logistics

Founder, 3Axes Printing Solutions | Mumbai, India *Dec 2017 – Sep 2019*

- Founded and operated a 3D printing business offered CAD design and prototyping services using FDM fabrication
- Conducted new product development, creating CAD designs and prototyping using laser cutting, sheet metal manufacturing, and 3D printing

RELEVANT PROJECTS

Indoor Localization using IMU and Wi-Fi FTM, Mechatronics and Robotics lab *Jan 2022 – Present*

- Designed an extended Kalman filter for pedestrian state estimation with heading correction using an IMU
- Developed sensor fusion algorithm to fuse Wi-Fi FTM data with IMU data, sub-meter localization accuracy ±0.5m

UR16e ROS2 interface and training, Tandon Makerspace *Aug 2022 – Present*

- Setup UR16e educational robot, developed training for Polyscope and ROS2, for hands on training
- Trained students for setting up sensor and microcontroller interface, and using robot states to program the robot

NeRF based Navigation for the blind *Aug 2022 – Dec 2022*

- Built localization pipeline in PyTorch for visually impaired persons employing NeRF (Neural Radiance Field) models
- Used visual odometry for tracking and localizing in the real world and trained NeRF scene representation of the same

Optimal Control of quadcopter (iLQR) *Aug 2022 – Dec 2022*

- Implemented iterative LQR control algorithm for trajectory planning of a 2D quadcopter with dynamic cost functions

Autonomous Delivery Robot *Jan 2022 – May 2022*

- Interfaced Raspberry Pi with multi-core Propeller microcontroller using UART communication protocol
- Implemented Dijkstra's algorithm for path planning based on real-time target and obstacle detection with camera

Smart Window Blinds *Nov 2021 – Dec 2021*

- Engineered a smart window blind that regulates indoor temperature by controlling the amount of light and insulation
- Re-engineered infrared NEC communication algorithm for wireless control of Basic Stamp2 microcontroller

SKILLS

- **Tools:** Solidworks, C++17, Python, PyTorch, Nvidia Jetson, R-Pi, Linux, ROS, OpenCV, MATLAB, Simulink,
- **Technical Skills:** Robot Manipulation, Robot Perception, Localization, Sensor Fusion, Path planning, State Estimation, Model Predictive Control, iLQR, Additive Manufacturing