CHARMIN PRITESH DESAI

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EDUCATION

The State University of New York at Buffalo (UB), NY, USA **Aug 2021 – May 2023**

- Master of Science in Robotics (Robotics & Artificial Intelligence)

Sardar Vallabhbhai Patel Institute of Technology (SVIT), Gujarat, India **Aug 2016 – Aug 2020**

- Bachelor of Engineering in Instrumentation & Control (Industrial Automation)

SKILLS

Programming Languages: C , Embedded C, Python, MATLAB & Simulink, Ladder Logic
Hardware: PLC, PID Control, Electrical, Electronics, Embedded Systems
Software: Machine Learning, Computer Vision, Image Processing, Robot Algorithms, ROS, Gazebo
Libraries: NumPy, Pandas, Matplotlib, OpenCV, TensorFlow, Sklearn, Keras

ACADEMIC PROJECTS

Autonomous Plant Watering Robot (ROS) **Sept 2022-May 2023**

- Developed an autonomous robot for watering plants in an unknown environment, facilitating SLAM Gmapping for creating occupancy grid. Further using A* path planning for generating a shortest path. Moreover, utilized AprilTags and robot's own velocity to localize the robot which is then used for plant searching and its pose estimation. Finally navigating to reach and water the plants effectively.

Analysis of Fanuc LR Mate 200-iD Robot Arm Manipulator **Sept 2021 - Nov 2021**

- Standardized position of 6-DOF robot manipulator's end-effector in base frame and world frame.
- Utilized Denavit-Hartenberg methodology and Forward Kinematics for calculations.
- Derived 6x6 Jacobian Matrix to generalize linear and angular velocities of the end-effector using DH Table.
- Chose Euler-Lagrange method to derive a mathematical model of 6-DOF robot manipulator.

Silo Process using PLC **Feb 2018 – May 2018**

- Empty bottles run on a conveyor by a 1-phase motor belt until detected by a photo-switch sensor. The sensor stops the motor and starts a LFM (liquid filling machine) for 3 seconds. Then the level sensor stops LFM and starts conveyor belt to run again to fill new bottles repeating each cycle for 6 seconds.

Batch Mixer Process Control using PLC **Feb 2018 – May 2018**

- Two pumps pour different fluids into 1 container until detected by a high limit level sensor. The fluid mixture is heated and processed by heater and spinning motor for a set timer of 30 seconds. Finally, an output valve opens and a third pump supplying the resultant fluid out in 10 seconds. Level of fluid in the container drops that is detected by low limit level sensor, that turns on the two pumps again repeating the cycle.

Embedded and Automation **2019 – 2021**

1. Invented miniature adapter to time any device/machine from 1-99 minutes with automatic turn-off functionality.
2. Reconstructed Indoor automatic lighting system controlled in 3 ways (PIR/IR Remote/Phone/Ambient Light).
3. Built an automatic system that detects & prevents water wastage and measures water consumption.

INTERNSHIP AND WORK EXPERIENCE

Teaching Assistant at University at Buffalo **Feb 2023 – May 2023**

- Teaching assistant of professor Dr. Vojislav Kalanovic (Program Director) in the course MAE594 Robotics 2.
  a) Conducted lectures on mathematical modelling of robot mechanisms and LABs on 6-DOF Jetmax Robot Arm.
  b) Simulated the robot on Gazebo and controlled the robot hardware via ROS-1 commands and programs.
  c) Calibrated 3 different end-effectors (electromagnetic suction cup, grippers, pen) with 1 AprilTag.
  d) Interfaced 5 different sensors like ultrasonic scan, display, dot matrix, touch control, fan tracking, etc.

Internship at Tara Mechons Pvt. Ltd. **Apr 2020**

- Devised an Automatic Turn-Off Electrical Cutting Machine for operator safety in a team of 4 members.
- Utilized a 4-pole relay contactor to interface 3-phase induction motor that powers the machine.
- NC contact switch breaks the circuit when lever arm of the machine is released, which turns it off.
- When lever arm is pulled, NC switch closes that completes the circuit, powering the machine on.

Internship at Larsen and Toubro Power Training **Jun 2019**

- Engaged in Training on Industrial Instrumentation.
- Learned about PLC, Ladder Logic programing, DCS, SCADA, industrial control valves and sensors.
- Studied different motor starters, e.g., 2-3-4 point, VFD's, Soft starter and DOL starter.