CHARMIN PRITESH DESAI

+1(716)-614-2519 | desaicharmin@gmail.com | LinkedIn | GitHub | Buffalo, NY, USA

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 to improve plant irrigation in an unknown household environment of size 400m^2.
- Facilitated SLAM Gmapping and image processing to create occupancy grid of size 400x400 numbers/pixels.
- Further A-star path planning algorithm was wielded to generate a 95% improved shortest path.
- Governed localization through apriltags and robot's velocity, later used for plant search and its pose estimation.
- Finally enhanced robot driver node for robot to navigate towards plants effectively.

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

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

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

- Empty bottles run on a conveyor by a 1-phase motor belt until identified by a photo-switch sensor.
- This halts the motor and starts a LFM (liquid filling apparatus) for 3 seconds. Finally level sensor ends LFM.
- Conveyor is commenced again to fill new bottles; this repeated each cycle for 6 seconds.

Controlled Batch Mixer Process through PLC **Feb 2018 – May 2018**

- Two pumps pour distinct fluids into 1 container until stopped by a high limit level sensor.
- Then fluid mixture is heated and processed by a heater and spinning motor for a set timer of 30 seconds.
- Finally, an output valve opens, and a third pump supplies resultant fluid out in 10 seconds.
- Lastly, due to less fluid in container, so detected by low limit level sensor, two pumps turn on that repeat the cycle.

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 ran robot hardware via ROS-1 commands and programs.
  c) Calibrated 3 unalike end-effectors (electromagnetic suction cup, grippers, pen) with 1 apriltag.
  d) Interfaced 5 different sensors like ultrasonic scan, display, dot matrix, touch, fan tracking, etc.

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

- Devised an Automatic Turn-Off Electrical Cutting System for operator safety in a team of 4 members.
  a) Interfaced 4-pole relay contactor to 3-phase induction motor that energized it.
  b) Lever when released, NC switch opened and disconnected the circuit that powered machine off.
  c) When lever was pulled, NC switch closed that completed this circuit, which turned mechanism on.

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

- Engaged in Training on Industrial Instrumentation and Control Systems.
  a) Learned about PLC, Ladder Logic programing, DCS, SCADA, industrial valves, and transmitters.
  b) Studied various motor starters. e.g., 2-3-4 point, VFD's, Soft starter and DOL starter.