Vaibhav Wanere

267-499-0483 | wanerevb@gmail.com | LinkedIn | Portfolio

Education

University of Pennsylvania — Philadelphia, PA
MS in Mechatronic and Robotic Systems — *Jan 2023 – Aug 2024*
- Courses: Mechatronic Systems, MicroElectromechanical Systems, Robotic Manipulators, Manufacturing

COEP Technological University — Pune, India
BTech in Mechanical Engineering — *Aug 2017 – Oct 2020*
- Courses: Design & Manufacturing Engineering, Metrology and Quality Control, Material and Process Selection

Projects

Autonomous Wall Following Robot | *Mechatronics* — Aug 2023 – Dec 2023
- Integrated an infrared sensor, Op-Amp based frequency detection circuit and motor drivers with ESP32-S2 MCU board and Vive-positioning system through on-board Wi-Fi to build an autonomous wall following robot.

Gesture Controlled Robot using Accelerometer, Arduino and Wi-Fi | *Mechatronics* — Sep 2023 – Dec 2023
- Integrated an ADXL345 accelerometer, Ultrasonic and Temperature Sensor and DC motors with the AtMega328p MCU using C Programming for a gesture controlled Mobile Robot driven through Wi-Fi.

Controlling Franka Emika Panda Arm for Pick and Place Tasks | *Robotics* — Jan 2023 – May 2023
- Python implementation of Inverse Kinematics solver for the 7 DOF Franka Panda to perform a pick and place task. The Robot detected object's pose using April tags and PnP pose estimation algorithm.

Design and Fabrication of a Pick and Place Robot | *Design & Fabrication* — Nov 2017 – June 2018
- Fabricated a manually controlled 3-DOF Pick and Place Robot having a spherical task space using spur gears, rack and pinion mechanism, acrylic sheet structure & DC motors.

Experience

Research Assistant — Feb 2024 – Aug 2024
University of Pennsylvania — *Philadelphia, PA*
- Fabricated in-house a batch of 5000 customised **silicon chips** on 4 inch SiO2-Silicon wafer and saved $2000.
- Designed a 50 μm pitch **wire bonding** process to attach a silicon chip on a screen printed sensor paper substrate.
- Investigated a procedure for flip chip bonding a MEMS resonator using conductive adhesives film onto a screen printed soil moisture sensor on a biodegradable substrate using FineTech Fineplacer Pico-2 flip chip bonding tool.

Manufacturing Quality Engineer — Nov 2020 – Jan 2023
Caterpillar Inc. — *Aurangabad, India*
- Installed a leak test system and **smart arm** for bolt torquing and achieved 14% reduction in assembly defects.
- Deployed a special purpose precision (±5%) Bluetooth depth gauge to reduce measurement time by 10%.
- Analysed bolt tension and clamping force under torquing using **ultrasonic (ToF) elongation measurement.**
- Automated and standardized sealant application process to reduce waste and improve sealing speed & quality.
- Prepared and analysed process capability charts, control charts, process flow diagrams to reduce inefficiencies.
- Conducted Gauge R&R analysis of torque wrenches & dial gauges to deploy on a new assembly value stream.
- Improved clamping force with same torque using oil at bolt threads and saved ($3000) on a new torque tool.
- Implemented Caterpillar bolted joint torquing and sealing standards in the Engine Assembly and rework processes.

Design Engineering Intern — May 2019 – July 2019
Cummins Technical Centre India — *Pune, India*
- Addressed customer-end assembly defect and saved $1000 by enhancing turbocharger design through the application of **CAD** in Creo Parametric, **Design for Manufacturability** principles and GD&T techniques.

Technical Skills

Mechatronics & Robotics: ESP32 C3, S2, AtMega MCU, Servo Motors, Sensor Integration: Accelerometer, IMU, Humidity, Temperature & Gas, Camera Calibration, Franka Panda Arm, Gazebo, Jetson Nano.

Software Tools: Creo, Solidworks, COMSOL, MATLAB, Minitab, Tableau, Power BI, R, Python, Git, C.

Mfg. Quality: Rapid Prototyping, GD&T, PFMEA & Control Plan, Gauge R&R, Bolted Joints.