Shivani Waje

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Introduction

A dedicated and highly motivated **M.Tech Mechatronics Engineer** with a strong foundation in mechatronics, industrial automation, IoT systems, and electronics integration. Experienced in developing innovative solutions by integrating mechanical systems with electronics and intelligent software. Skilled in leveraging Python programming and modern engineering tools to deliver reliable, cost-effective, and efficient engineering systems. Adept at contributing to multidisciplinary teams, solving real-world industrial problems, and continuously enhancing technical competencies.

Summary

- Strong understanding of **IoT Systems Design & Development**, including sensors, actuators, microcontrollers (Arduino, Raspberry Pi), and protocols (MQTT, HTTP, Modbus) for smart automation projects.
- Proficient in **Python Programming** for data handling, automation scripts, and embedded systems; familiar with C/C++ for microcontroller applications.
- Practical experience in **deep learning integration** with edge devices (Raspberry Pi) for real-time quality control and industrial inspection.
- Competent in **technical documentation**, reporting, and collaboration within multidisciplinary engineering environments.
- Skilled in **CAD and Simulation Tools** such as AutoCAD and MATLAB/Simulink for mechanical design.

Education

COEP Technological University, CGPA: 8.57 (80.7%)   Sept 2023 – July 2025
- M.Tech - Mechatronics

Sir Visvesvaraya Institute of Technology, CGPA: 8.24(72.54%)   Aug 2017 – July 2021
- B.E - Mechanical Engineering

K.T.H.M. College, Perct: 71.08%   July 2015 – June 2017
- H.S.C

Loknete S.B Waje Vidyalaya , Perct: 89.40 %   June 2014 – Mar 2015
- S.S.C

Experience

Intern, Shree Swami Samarth Industries – Malegaon MIDC , Sinnar (12 Months)   Sept 2021 – Sept 2022
- Conducted inspection and quality checks of fabricated components produced through CO2 welding and arc welding, ensuring adherence to design specifications and welding standards.
- Performed cost estimation and prepared quotations, supporting negotiations with clients and vendors to achieve cost-effective and competitive pricing.
- Prepared and maintained material balance sheets, tracking material usage, inventory, and wastage to optimize resource utilization and control costs.
- Collaborated with production and procurement teams to streamline fabrication processes, improve quality, and minimize material and operational costs.

Publications

Real Time Capsule Inspection & Quality Control Using Deep Learning   June 2025

THE 16th INTERNATIONAL IEEE CONFERENCE ON COMPUTING, COMMUNICATION AND NETWORKING TECHNOLOGIES (ICCCNT), July 6–11, 2025, IIT Indore, Madhya Pradesh, India

International Research Journal of Engineering and Technology (IRJET), July 7 2021

Projects

IOT based Quality Assurance/ Quality Control of Capsule Manufacturing System   M.Tech - 2025

- Designed and implemented an IoT-enabled, low-cost capsule quality inspection system, utilizing a Raspberry Pi with a camera and deep learning model to detect and classify capsules in real-time as "OKAY" or "NOT_OKAY".
- Developed, trained, and optimized a lightweight MobileNetV2-based deep learning model, converted to TensorFlow Lite for efficient edge deployment, ensuring fast and accurate inference directly on the Raspberry Pi without cloud dependency.
- Engineered an integrated data pipeline and control logic, enabling seamless image acquisition, classification, and synchronized actuation of a stepper-motor-driven conveyor and servo-based rejection mechanism for defective capsules.
- Created an interactive, web-based dashboard, providing real-time monitoring of the inspection process, live classification feedback, batch-wise quality analytics, and logging for production traceability and decision-making.
- Achieved high performance and impact, reaching 98% classification accuracy and 95% mechanical sorting precision, significantly enhancing the quality assurance and operational efficiency in small-scale pharmaceutical manufacturing.

Optimization of Drilling Machine and Drilling Process   June - 2021

- Designed and fabricated a customized drill jig tailored to the specific component requirements, enabling more precise and repeatable drilling operations compared to conventional methods.
- Analyzed existing process inefficiencies, identifying key issues such as frequent misalignment of workpieces, high defect/rejection rates, excessive material wastage, and long setup/changeover times.
- Optimized drilling parameters and workflow, including feed rates, jig clamping mechanisms, and alignment guides, to minimize errors and improve overall operational performance.
- Achieved significant improvements in manufacturing outcomes, such as precise hole positioning, reduced material wastage, lower rejection rates, and improved production speed and consistency.
- Demonstrated a cost-effective and scalable process improvement, showcasing how simple yet thoughtful fixture design can enhance quality, throughput, and efficiency in a manufacturing environment.

Certificates

- **Introduction to Internet of Things** – NPTEL

- **Introduction to Industry 4.0 and IIoT** – NPTEL

- **Computer Integrated Manufacturing** – NPTEL

- **MATLAB Onramp**

Technologies

Languages: Python

Simulation Tools: Auto-Cad,Matlab, FluidSIM

Tools: MS-Office, Latex