VIVEK VYAS

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Portfolio

PROFESSIONAL SUMMARY

Master's graduate in Artificial Intelligence with hands-on experience in designing, evaluating, and integrating AI systems into real-world industrial environments. Strong focus on AI solution architecture, decision support systems, and applied machine learning with business impact.

PROFESSIONAL EXPERIENCE

Master's Thesis – Münster, North Rhine-Westphalia, Germany **Jan 2025 – Oct 2025**
Topic: AI-Optimized Battery Manufacturing: Simulation & Smart Scheduling
Fraunhofer FFB Institute, Munster, Germany

- Smart Scheduling & Simulation: Integrated AI-based predictive models with industrial simulation data to optimize battery production workflows and throughput.
- ML Pipelines: Design of end-to-end AI solution flows (data → model → API → system integration)
- System Validation: Evaluated and compared ML models to ensure reliability and performance in a production environment.
- Tech Stack: Python, Siemens Plant Simulation, SimTalk, Machine Learning (Scikit-learn/TensorFlow), REST APIs.

Trulloy Software and Solutions- Bhavnagar, Gujarat **May 2021 – Jan 2022**
Intern Position: Machine Learning Intern

- Data Automation: Developed automated pipelines using Python (Pandas, NumPy) to process and clean large datasets, significantly reducing manual analysis time.
- Model Deployment: Assisted in the development and deployment of ML models for business logic automation and decision support.
- Tech Stack: Python, Scikit-learn, TensorFlow, Data Processing Pipelines.

EDUCATION

M.Sc. Artificial Intelligence for Smart Sensors and Actuators **Oct 2022 - Ongoing**
Deggendorf Institute of Technology (DIT)- Technische Hochschule Deggendorf, Cham

- Focus: Industrial AI, Predictive Maintenance, Computer Vision, Time-Series Analysis, and Intelligent Systems.
- Key Application: Applied AI techniques specifically for anomaly detection and system optimization in industrial use cases.

Bachelor's Degree: Electronics and communication Engineering **July 2018 - July 2022**
Gujarat Technological University (GTU)- Government Engineering College, Bhavnagar

- Focus Areas: AI Algorithms, Control Systems, VLSI Design, IoT Protocols, and Real-time Monitoring Systems

TECHNICAL SKILLS

- Core AI & Data: PyTorch, TensorFlow, Scikit-learn, LLMs, RAG, Computer Vision, Pandas, NumPy, Power BI.
- Languages: Python, C/C++, Embedded C, JavaScript, SQL, .NET.
- Industrial & DevOps: Siemens Plant Simulation (SimTalk), Docker, Kubernetes, AWS, Azure, CI/CD, Git.

PROJECTS

Project 1: Building Age Prediction — Group Case Study

- Utilized machine learning for predicting building age from satellite imagery.
- Developed robust data pipelines and automated processes for anomaly detection and data preprocessing. This experience with processing large datasets and applying AI is directly relevant to automating and optimizing data analysis.
- Technologies Used: Python, OpenCV, TensorFlow

Project 2: Hexapod Robot — Group Case Study

- Simulated the kinematics of a hexapod robot, implementing a PID controller for precise movement and stability.
- Validated robot performance through virtual testing environments involving time-dependent system behavior.
- Tech: MATLAB, Simscape, PID Control.

Project 3: MEMS Gyroscope Simulation and Validation — Group Case Study

- Description: Developed a mathematical model for a MEMS gyroscope in MATLAB Simulink, incorporating spring geometry, damping forces, and Coriolis effect for sensor validation. The model was experimentally validated using an Arduino-controlled rotary encoder setup. Compared gyroscope readings with encoder data to ensure accuracy.
- Key Contributions: Designed and implemented the experimental setup to validate the gyroscope's performance, contributed to model implementation, and analyzed the results using MATLAB tools.
- Technologies used: MATLAB Simulink, Arduino Uno, ITG-3200 Gyroscope, Rotary Encoder.

Project 4: Embedded System Light Control — Group Case Study

- Engineered an energy-efficient control system integrating LDR and PIR sensors to adjust lighting based on motion and ambient conditions.
- Tech: Embedded C, Arduino, IoT Sensors.

Project 5: Contour Detection using Computer Vision — Mini Project

- Designed a system for object boundary detection, utilizing unsupervised learning techniques for image segmentation. This system demonstrates skills transferable to predictive maintenance tasks requiring precise pattern and anomaly detection in sensor data.
- Technologies Used: Python, OpenCV, Scikit-learn

Project 6: Face Mask Detection — Mini Project

- Designed a scalable, real-time object detection system using CNNs to identify face mask compliance in video streams.
- Optimized OpenCV preprocessing and batch inference to ensure low-latency performance suitable for retail or transport deployment.
- Tech: Python, OpenCV, TensorFlow/Keras, CNN.

Project 7: Stock Price Prediction Using LSTM Neural Networks — Self Study

- Developed a time-series forecasting model using LSTM neural networks to predict stock trends.
- Deployed the model via a Flask API to demonstrate end-to-end integration suitable for business intelligence dashboards.
- Tech: Python, LSTM (Deep Learning), Flask, yFinance API.

LANGUAGES

- German: B1 (learning, actively improving) , English: C1 (Advanced), Gujarati (Mother Tongue), Hindi (Fluent)

INTRESTS

- AI for Industrial Optimization, Smart Manufacturing, Data Analysis, Predictive Maintenance, Factory Automation.
- Experienced in handling large datasets and developing predictive models for anomaly detection, Compuer Vision and Image processing Techniques, Big data and Analytics, Intelligent and IoT Systems, Autonomous and Robotics Systems.