

# VIVEK VYAS

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## 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*

- Developed production-oriented machine learning pipelines for large, structured industrial datasets, with focus on data quality, model validation, and system integration. Evaluation and comparison of ML models and AI tools based on performance and reliability. Design of end-to-end AI solution flows (data → model → API → system integration)

### Trulloy Software and Solutions- Bhavnagar, Gujarat

May 2021 – Jan 2022

*Intern Position: Machine Learning Intern*

- Machine Learning Intern: Applied Python and machine learning libraries (NumPy, Pandas, Scikit-learn, TensorFlow) to analyze large datasets and develop automated pipelines for data processing. Gained experience in automating analysis workflows, a crucial skill for managing.

## EDUCATION

### M.Sc. Artificial Intelligence for Smart Sensors and Actuators

Oct 2022 - Ongoing

Deggendorf Institute of Technology (DIT)- Technische Hochschule Deggendorf, Cham

- Machine Learning, Predictive Maintenance, Time-series Data Processing, Intelligent Systems, Data Automation for System Optimization. Applying AI techniques for industrial use-cases, with strong emphasis on anomaly detection and predictive maintenance.

### 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

- Programming & Data Analysis: Python, Pandas, NumPy, Matplotlib, Scikit-learn
- Machine Learning: Supervised learning, classification, regression, time-series forecasting, model evaluation, video analysis, time-series modeling, OpenCV, PyTorch, TensorFlow, LLMs / RAG / Multimodal, image preprocessing, frame analysis
- Data Handling: Processing test and field data, data cleaning, structuring large datasets
- Reporting Tools: MS Excel, PowerPoint, Word; Matplotlib
- Software & Tools: Plant Simulation, SimTalk, Flask, SQL, Jupyter, Git
- Model Deployment & Serving: Flask, REST APIs, Docker, CI/CD, GitLab, Azure, AWS, Git Lab, Containerized deployment with Docker; basic exposure to Kubernetes concepts
- Generative AI systems (ChatGPT-style models) for decision support and automation

## PROJECTS

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### 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

- Inspired by insect locomotion, this project focused on designing and simulating a hexapod robot using MATLAB and Simscape. The simulation included a PID controller for precise movement, validated through extensive testing. Additionally, explored virtual testing environments to simulate and refine the robot's performance. Worked with sensor-like data streams and time-dependent system behavior.
- Technologies Used: 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

- Description: Developed an automatic lighting control system using Light Dependent Resistors (LDR) and Passive Infrared (PIR) sensors. The system automatically adjusted lighting based on ambient light levels and motion detection to save energy. This project explored the practical applications of embedded systems in energy-efficient lighting solutions.
- Key Contributions: Designed and implemented the lighting control system, including integration with LDR and PIR sensors. Conducted system analysis to optimize performance and reduce energy consumption.
- Technologies used: LDR Sensors, PIR Motion Sensors, Arduino, MATLAB, Embedded C.

### 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

- This project involved designing a real-time system to detect face masks using Python, OpenCV, and a Convolutional Neural Network (CNN), Open CV, Python
- Real-time face mask detection showcased my ability to integrate AI solutions into production systems requiring scalability and reliability, such as retail or transport.
- Optimized OpenCV preprocessing and batch inference to keep pipelines fast and stable

### Project 7: Stock Price Prediction Using LSTM Neural Networks

Self Study

- Developed a time-series model for stock price prediction using LSTM. Applied similar techniques for high-dimensional data processing that can be used in biopharmaceutical environments to predict trends in bioprocess data. Analysis of business and technical processes to identify AI optimization potential.
- Technologies Used: Python, LSTM, Flask, yFinance API

## LANGUAGES

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

## INTERESTS

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