ARYAN YADAV

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Mechatronics Engineering student (B.Sc., THWS Würzburg-Schweinfurt) with hands-on experience developing machine learning and computer vision systems for industrial applications. Proficient in Python, PyTorch, deep learning, and applied AI. Proven track record delivering end-to-end ML pipelines, predictive maintenance models, and IoT platforms in industry-cooperative research settings. Seeking an ML engineering internship.

EDUCATION

B.Sc. Mechatronics Engineering *Oct 2023 – Present*

THWS Würzburg-Schweinfurt

TECHNICAL SKILLS

Languages	Python (advanced), C++, Node.js, MATLAB, Simulink
ML and AI	PyTorch, MobileSAM, YOLOv8, OpenCV, Scikit-learn, Random Forest, SVM, Neural Networks, Deep Learning
Data	Pandas, NumPy, Pydantic v2, Time Series Analysis
Hardware	Intel RealSense D435i/f, Raspberry Pi, ESP32, NVIDIA RTX 3050
Platforms	MQTT, REST APIs, AWS, Oracle Cloud

PROJECTS

Automated Tube Classification Pipeline *Jan 2026 – May 2026*

THWS Industrial Project | Client: Lukas Koeniger

- Developed and deployed a **6-stage deep learning vision pipeline** (Intel RealSense D435i/f, MobileSAM instance segmentation, rembg) achieving **95%+ classification accuracy across 16 blood-tube classes** on 500 annotated images, eliminating a manual annotation bottleneck.
- Implemented a multi-stage annotation system with geometry constraints, IoU thresholding (0.92+), and manual QA; engineered solutions for ring-light IR interference and depth-based discrimination via a custom **Volume Declaration Gate**.
- Architected **Pydantic v2 config-based versioning** for reproducible, auditable dataset generation; developed a depth mask refiner module with dynamic depth-band filtering and morphological post-processing for multi-tube scenes.

Digital Twin and Predictive Modelling – Combined-Cycle Power Plant *Jun 2025 – Sep 2025*

- Developed an end-to-end digital twin integrating MATLAB/Simulink physics modelling with a Random Forest ML ensemble trained on **24+ months of operational time series data**, delivering **99.1% prediction accuracy on held-out simulation data** for predictive maintenance.
- Quantified model uncertainty via ensemble confidence intervals, enabling risk-aware operational decision support and predictive maintenance workflows.

Real-Time Energy Management Platform *2025*

IBM TechXchange Hackathon 2025 | 48-hour sprint

- Architected a full-stack IoT platform (Node.js, SwiftUI, IBM Granite LLM) achieving **sub-100 ms API latency** under concurrent device load via WebSocket and in-memory caching.

Smart Home Automation System *Oct – Dec 2024*

- Designed and implemented a scalable IoT architecture (Raspberry Pi, MQTT, 20+ sensors) with an event-driven Python automation engine and a Node-RED monitoring dashboard for real-time control and alerting.

CERTIFICATIONS AND AWARDS

- Oracle Cloud Infrastructure Generative AI Professional – Oracle (2025)
- IBM TechXchange Hackathon Finalist – IBM (2025)

LANGUAGES

Hindi	Native
English	Fluent (C1+)
German	Elementary (A2, actively developing)