

Zamal Babar

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EDUCATION

Friedrich-Alexander-Universität (FAU)

Erlangen, Germany

Master's Degree in Electromobility-ACES (Focus: AI & Sustainable Mobility)

2023 – Present

Key Courses: Machine Learning, Deep Learning, Robotics Frameworks (ROS), Autonomous Systems, Mechatronics, Sustainable Mobility, Control Systems

Objective: Seeking a Master Thesis in Data-Driven Development with Agentic AI, aligning with modern reprocessing frameworks for Autonomous Driving.

Osmania University

Hyderabad, India

Bachelor's Degree in Automobile Engineering

2018 – 2022

Grade: 1,9 University Rank: 3

Key Subjects: AI for Mobility, Industry 4.0, Programming, Data-Driven Algorithms, IoT, Autotronics

EXPERIENCE

Working Student ML

Aug. 2024 – Present

Deutsche Börse Group

Frankfurt, Germany

- Developed an AI pipeline to reprocess large-scale financial data in a **Cloud** environment (Vertex AI, BigQuery).
- Built **BERT**-based NER modules to parse financial reports, cutting manual extraction time by 80%.
- Integrated **RAG** based system with vector embeddings, facilitating real-time data store retrieval.

Projektarbeit (Factory Automation Lab)

Apr. 2024 – Present

Production Systems Lab, FAU

Erlangen, Germany

- Developed a **Digital Twin** of robotic systems in **Gazebo**, enabling re-simulation for optimized industrial workflows.
- Integrated **LLM-driven** robotic control in **ROS** (MoveIt, Rviz), improving sensor data acquisition for incremental function evaluation.

SELECTED PROJECTS

ftBoost: Data Augmentation for Agentic Conversational Models

- Implemented a **Streamlit**-based tool for large-scale conversational data augmentation (OpenAI, Gemini, Mistral, Llama formats).
- Utilized **LangChain Groq** for AI-driven augmentation and multi-stage refinement, ensuring high KPI metrics for semantic accuracy.
- Demonstrated advanced **cloud-based** deployments and HPC optimization for data throughput.

Multimodal Chat PDF - Hugging Face RAG Chatbot

- Built the first open-source **Multimodal AI** chatbot to reprocess text + image data from PDFs for Q&A tasks.
- Achieved near real-time vector-based retrieval (**ChromaDB**), integrating **4-bit quantized** LLMs for efficiency.
- Enhanced speed and lightweight performance with quantizations, enabling large-scale data handling.

InboxHero - AI-Powered Email Management

- Featured by **LangChain** across all its official social media handles, automating email prioritization, summarization, read attachments and in-line responses via advanced LLMs.
- Showcased data-driven categorization and incremental function improvement to handle large-scale user inbox data.

Molmo 4-Bit Quantized Vision Transformer

- Reduced model size from 30GB to 6GB using **bitsandbytes** and **accelerate** for quantization, enabling VRAM-friendly deployments.
- Gained 1000+ downloads on Hugging Face, demonstrating the model's effectiveness in resource-constrained edge scenarios.
- Made it to the most trending spaces on Huggingface for two days.

OPEN SOURCE CONTRIBUTIONS

WebRover

Enhanced github.com/hrithikkoduri/WebRover, an AI-driven web agent for autonomous research workflows.

CVZONE Library

Authored documentation for github.com/cvzone, lowering adoption barriers with real-world examples.

ScrapeGraphAI

Contributed to *ScrapeGraphAI* by resolving **Windows asyncio event loop** issues in Playwright-based scraping. Ensured cross-platform stability for advanced web automation and data workflows.

PACKAGE

augmenting

A *PyTorch*-based image and annotations augmentation tool (15,000+ downloads), supporting *YOLO* & *COCO* formats. Offers no-code transformations to boost computer vision pipelines.

COMMUNITY MEMBER

Hugging Face Social, AutoGPTQ, Zero-GPU, Lora-Concepts, MLX-community

TECHNICAL SKILLS

Languages: C++, Basic JavaScript, Python (L^AT_EX for documentation)
ML/AI: PyTorch, TensorFlow, Transformers, HPC quantization, LLMs, scikit-learn
Cloud: Infrastructure as Code, GCP (Vertex AI, AlloyDB), Azure, Docker, Kubernetes
Web Development: Frontend (Basic JavaScript, HTML/CSS), Backend (Basic Node.js), REST APIs
Databases: NoSQL (MongoDB, Firestore), MySQL/PostgreSQL
Tools: Git/GitLab, Linux (SSH, CLI), VSCode, ROS (MoveIt, Gazebo), HPC pipelines
CAD/Simulation: MATLAB, Blender, Fusion360, CATIA V5, Solidworks, Ansys Workbench

LANGUAGE SKILLS

German: A2 (Actively Learning)
English: C1 (Highly Proficient)
Other: Hindi, Urdu, Telugu