Muhammad Hassan Saleem

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LinkedIn GitHub

SUMMARY

Being an AI Engineer and having a firm background in mechanical engineering, I am committed to building intelligence that simplifies complex systems in manufacture and engineering. I have knowledge in the design, development, and roll-out of machine-learning models, large language models (LLMs), computer-vision based solutions, CAD-automation tools. Right now, I am working on MAindTec GmbH, offering AI-powered technologies used to automate and optimize the workflow, reduce the operational costs, and drive the digitalization across industrial and manufacturing companies. With the goal of fusing conventional engineering traditions with artificial intelligence in mind, I striving to develop more intelligent, proficient and sustainable solutions that can help industries evolve with innovative ideas.

EXPERIENCE

Development Engineer - AI Solutions Jan 2025 – Present

MAindTec GmbH — Ingolstadt

- Built specialized **LLM- and LVM-based AI agents** for metadata extraction, geometry analysis, manufacturing process planning, and cost estimation from 3D CAD models.
- Supported deployment of a production-grade **multimodal RAG-based document query system** using Docker, Azure, Llama Index, Lang Chain, Milvus, and GitHub CI/CD automation.
- Developed an **AI system to automate 2D mechanical drawings interpretation** by labeling customer datasets with Label Studio and fine-tuning YOLOv8 with LVM agents for extracting 2d/3d views, dimensions, BOM, and metadata.
- Designed an **AI-powered design review pipeline** for 2D mechanical technical drawings using **Llama Index and Mistral** to detect errors, missing dimensions, incorrect annotations, and incomplete manufacturing information—helping customers prevent production issues.
- Designed a **chat-based AI system for mechanical drawings using Docling, LVM, and LLM agents** to extract and query dimensions, BOM, annotations, and geometry from PDFs.
- Linked **Model Context Protocols (MCPs**) to integrate chat-based LLMs like Claude with 3D CAD tools, allowing users to automate parametric modeling through natural language.
- Prototyped a **prompt-to-3D pipeline that converts natural language commands into 3D printable models**, using a prompt-to-image diffusion model followed by image-to-3D conversion for outputs like an 'F1 car toy.'

Working Student – Research Scientist Jul 2023 - May 2024

Fraunhofer IPA, Stuttgart

- Conducted **research** in computer-aided production planning and developed software functions for automated work plan generation.
- Automated generation of **CAD parts** datasets for machine learning training.
- Built ML models for CAD feature prediction with **80% accuracy,** enhancing manufacturing efficiency.
- Conducted master's thesis benchmarking **7 CAPP systems** and developed an evaluation tool.
- Designed **27+ complex** 3D mechanical CAD models using SolidWorks.

Junior Machine Learning Engineer May 2022 - Apr 2023

Cyberify, Multan

- Deployed and customized **5+ ML models** for business automation tasks.
- Supported ML-Ops pipelines, reducing model deployment time by **~30%**.
- Contributed to **2 multimodal AI projects**, combining text and image data.
- Trained and fine-tuned **10+ ML models** with TensorFlow, Keras, and PyTorch.

Python Developer Dec 2021 – Apr 2022

Cyberify, Multan

- Developed and maintained Python scripts for data processing and automation.
- Worked with NumPy, Pandas, and Matplotlib for data analysis and visualization tasks.
- Assisted in creating small tools to support business operations and improve productivity.
- Contributed to data-driven reports that supported decision-making processes.

Trainee Test Engineer Jul 2021 – Nov 2021

Changan Automobile, Multan

- Checked and validated automotive CAD models for accuracy and manufacturability.
- Performed dimensional analysis and quality checks on mechanical components.

EDUCATION

Master of Engineering (M.Eng.) - Artificial Intelligence for Smart Sensors and Actuators
Deggendorf Institute of Technology, Deggendorf
Mar 2022 - Apr 2024

Thesis: Development of a Benchmarking Environment for CAPP Systems

Projects:

- Turtle Bot Automatic Parking System using LIDAR and ROS.
- Speech Command Recognition System using Pytorch.
- Car detection System

Bachelor of Science (B.S.) - Mechanical Engineering
Ghulam Ishaq Khan Institute of Science and Technology, Topi
Sep 2017 - Jun 2021

Thesis: Development of Four-wheel steering mechanism

SKILLS

Expert: Python, Machine Learning, LLMs, Computer Vision, Statistical Analysis, PTC Creo, Data Processing

Proficient: LlamaIndex, Milvus/Pinecone, PyTorch, TensorFlow, Fast API, Git, Docker, Multimodal Generative AI

Familiar: Model Context Protocol, Linux, CI/CD Pipelines, SolidWorks, Siemens NX

LANGUAGES

German – Intermediate

English – Fluent

LICENSES & CERTIFICATIONS

Specialization In Machine Learning – 2024
Deep Learning.AI