Aakash Sarin

Artificial Intelligence Engineer specialising in Generative AI with a proven track record in autonomous systems.

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Born in India, 25/04/1999 | **asarin.info@gmail.com** | **Github** | **LinkedIn**
Holding a valid work visa for Germany or similar. My notice period is 20 days.
German language proficiency B1 (currently learning).

TECHNICAL SKILLS *(*Years of Experience)*

Languages: Python (4) | C++ (4) | SQL (4) | Golang (1) | Node.js (1)
Frameworks/Libraries: FastAPI (2) | Pandas (3) | NumPy (3) | Matplotlib (3) | OpenCV (4) | NLTK (3) | Spacy (3) | scikit-learn (3) | XGBoost (3) | FastText (2)
Databases: MySQL(4) | PostgreSQL (4) | MongoDB (2) | Azure Data Lake (2) | Chroma Vector DB(1)
IDE/Developer Tools: Git (4) | Azure DevOps (2) | Docker (2) | Postman (3) | VSCode (3)
Deep Learning Frameworks/Tools: PyTorch (3) | TensorFlow (3) | Keras (3) | Langchain (2) | Vllm (2) | Text Generation Inference (1) | Deepspeed (1) | PEFT (LoRA, QLoRA) (1) | MLFlow (1)

WORK EXPERIENCE

01/2023 – Present

AI Research Engineer
Robotics Research Lab - RPTU, Kaiserslautern, Germany
Project: LLMs for Reasoning in Autonomous Driving.

- Achieved **92% accuracy** in predicting driving actions by developing a **multi-modal fusion** architecture, combining vision, language, and knowledge representation models.
- Developed a **Retrieval-Augmented Generation**(RAG) pipeline with 85% relevance in retrieved information, trained on a comprehensive dataset of driving laws.

Technologies used: Multi-Modal Fusion | Python | VLM | NLTK | RAG | PyTorch | Langchain | LLM Agents.

Project: Single-Camera BEV Optimization in Autonomous Vehicles.

- Extended BEVformer for a monocular setup, resulting in a **3% improvement** in the NuScenes Detection Score.
- Improved spatio-temporal information extraction for occluded object detection by integrating spatial cross-attention and temporal self-attention techniques.

Technologies used: Python | PyTorch | Spatial Temporal Cross Attention.

09/2023 – 07/2024

AI Research Assistant
Augmented Vision Group - Deutsches Forschungszentrum für Künstliche Intelligenz , Kaiserslautern, Germany
Project: Digital Twin 4 Trucks

- Engineered a **Camera API** for real-time multi-camera data acquisition of truck assembly lines. This improved high-throughput data acquisition and production line **monitoring by 30%** while reducing **data errors by 50%** for digital twin development.

Technologies used: Python | PyTorch| Arcana | NumPy | Pandas | Autoencoders | Real-time data acquisition | Camera API.

Project: Conversational Chatbot

- Created a **conversational AI agent** using a Frozen RAG architecture with a BM25 retriever.
- Achieved **92% query resolution** accuracy, improving retrieval performance by 12% with multiple embedding models.
- Deployed on FastAPI, handling up to **1,000 queries per minute** with minimal latency.

Technologies used: Python | Azure | FastAPI | Vllm | Chroma DB.

Project: Natural Language to SQL

- Built an AI platform to convert **natural language to SQL** queries using LLMs. Pre-trained and fine-tuned **Mistral-7B** and **Codellama-7B** on SQL Context Dataset.
- Improved **accuracy by 30%** using Parameter Efficient Fine Tuning (PEFT) techniques like **LoRA** and **QLoRA**. Extended capability to generate summarizations of large SQL tables.

Technologies used: Python | Postgres | MySQL | Vllm | Pydantic.

12/2019 – 05/2020 **ML Research Intern**
Centre for Artificial Intelligence and Robotics, DRDO, Bangalore, India.
Project: Deep Learning-Based Surveillance Using Face Recognition.

- Developed a tracking algorithm and **ROS drivers** for PTZ IP cameras. Implemented 2D interpolation using **Delaunay Triangulation** and **Gouraud Shading** to extrapolate from known GPS coordinates.

Technologies used: ROS | C++ | Python | OpenCV.

06/2018 – 07/2018 **Summer Research Intern**
Aeronautical Development Establishment, DRDO - Bangalore, India.
Project: Altitude Selection for Long Endurance UAV

- Designed an **altitude selection module** for a MALE UAV developed by ADE, enhancing its navigation system.
- Conducted unit and integration testing, including **hardware-software integration testing** (HSIT), to ensure smooth communication between software and hardware.

Technologies used: ROS | C++ | Python.

EDUCATION

04/2021 – 12/2024 **Master of Sciences in Informatik (Spl. in Artificial Intelligence)**
Rheinland-Pfälzische Technische Universität (RPTU), Kaiserslautern, DE

06/2016 – 05/2020 **Bachelor of Technology in Computer Science and Engineering**
SRM Institute of Science and Technology, Chennai, IN

ACHIEVEMENTS / CERTIFICATIONS

CeNSE Summer School on Semiconductor Technology and Microfabrication | 3rd Inria-DFKI European Summer School on AI | Microsoft Certified: Azure Fundamentals | Microsoft Certified: Azure AI Fundamentals | DIAT Certified Artificial Intelligence Professional | Deep Learning Specialisation by Andrew Ng

LANGUAGE SKILLS

English (C2) | German (B1, currently learning)