

# Moosa Qaisar

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## SUMMARY

I build systems that understand, see and think. As a software developer with hands on experience in building NLP, RAG and computer vision systems. Specialize in designing and deploying AI agents that solve real-world problems. I focus on building intelligent systems that can be integrated into scalable business workflows.

## EDUCATION

### University of Engineering and Technology, Taxila

Bachelor of Science in Computer Engineering

## EXPERIENCE

### Digital Empowerment Pakistan

June. 2024 – July. 2024

#### AI INTERN

- Built a RAG chatbot to query multiple PDFs as a unified knowledge base.
- Deployed local LLM (Phi-3 via llama-cpp) for fast, private answer generation.

### Neuron Tech

Jul. 2024 – Aug. 2024

#### RESEARCH INTERN

- Researched and prototyped large-scale data processing systems using Apache Spark
- Built simulation prototypes for data-driven applications

### Levrify

Sep. 2024 – Oct. 2024

#### DATA SCIENCE INTERN

- Built simulation prototypes for data-driven applications.
- Completed data analytics capstone, qualified for AWS Cloud Practitioner training.

## PROJECTS

### DeepResearch-Agent: An Autonomous Research System | Python, Langchain, Sentence-Transformers, FAISS, Tevily

- Engineered a sophisticated, multi-stage **AI agent** to perform in-depth research and generate comprehensive, cited reports on complex topics.
- Architected a RAG pipeline, utilizing **hybrid search** (vector + keyword) and cross-encoder re-ranking to ensure high factual accuracy and relevance.
- Implemented a cascading Natural Language Understanding (NLU) module to robustly interpret **user intent** and scope research tasks with precision.
- Developed an iterative 'outline expansion' loop, enabling the agent to autonomously deepen its research plan and enhance the final report's depth and quality export to markdown and formatted PDF with sources citation.

### Optimized RAG System for Information Retrieval | Python, Transformers (Phi-3), Cross-Encoders, FAISS, BM25

- Demonstrated end-to-end NLP system development with relevance-based document retrieval
- Architected a hybrid retrieval module integrating BM25 (sparse, keyword-based) and FAISS-indexed sentence embeddings (dense, semantic-based) to maximize **context relevance** for varied user queries.
- Implemented a critical cross-encoder reranking stage that significantly refined retrieval precision by evaluating and re-sorting candidate documents based on deep contextual understanding.
- Integrated and managed a local open-source LLM (Microsoft Phi-3), employing advanced prompt engineering optimizing for fact-based responses and efficient information extraction.

### Brain Tumor Segmentation using Residual U-Net | Python, CNN, TensorFlow/Keras, OpenCV, NumPy

- Custom U-Net architecture incorporating residual blocks to accurately segment brain tumors from MRI scans.
- Comprehensive image processing pipeline including median filtering and unsharp masking to enhance image quality and improve segmentation robustness.
- Managed the end-to-end model development lifecycle, from data loading and preprocessing of the **Br35H** dataset to model training, evaluation, and visualization of segmentation results

### FYP on AES Core Hardware Accelerator on FPGA (Artix-7) | Verilog, Xilinx ISE, Digilent Adept, FPGA, Artix7

- Designed and implemented a pipelined AES encryption and decryption core optimized for secure, high-speed
- Developed simulation test benches using Xilinx ISE, Vivado, and iSim tools to validate functionality
- Analyzed resource utilization (LUTs, flip-flops) and achieved high throughput across FPGA prototypes

## TECHNICAL SKILLS

**Languages:** Python, JavaScript, C/C++, HTML/CSS

**Developer Tools:** Git, Docker, Cursor, Linux, Google Cloud Platform, Kaggle, VS Code, PyCharm, IntelliJ, Jupyter

**Libraries:** TensorFlow, PyTorch, Keras, scikit-learn, Hugging Face, OpenAI, Gemini, Pandas, NumPy, Matplotlib

## CERTIFICATIONS

**Google Cloud – Generative AI:** Transformers, BERT, Encoder-Decoder, Attention Mechanism, Image Generation, Image Captioning Models.