Alwin Paul

Cottbus – Germany

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Objective

Motivated AI Master's student with hands-on experience in **AI agent development, multi-agent systems, and workflow automation**. Experienced in building **intelligent assistants, Graph RAG systems, and automation pipelines** using modern AI tools. Seeking opportunities to contribute to innovative AI projects through **specialized AI agents, content generation pipelines, and platform integrations**.

Professional Experience

Perinet GmbH   **Cottbus, Germany**
Working Student - AI & Systems Engineer   *07/2024 – present*

- ○ Architected and deployed a **Graph RAG system** to address fragmented internal documentation, troubleshooting guides, and FAQs across multiple sources. Built relationship-aware knowledge graphs using Python, LangChain, Neo4j, and embedding models to enable contextual information retrieval that captures document interconnections and dependencies.
- ○ Designed an **intent-based chatbot** utilizing **Natural Language Processing (NLP)** and embedding models to improve contextual understanding and user interaction.
- ○ Explored **LLM deployment and optimization** on ARMv7 Cortex-A8/A9 architectures, benchmarking frameworks such as llama.cpp, TinyLlama, and WebAssembly (WASM) for efficient inference.
- ○ Collaborated with cross-functional engineering teams to analyze system constraints and enhance on-device AI capabilities.
- ○ Integrated AI models into internal workflows for automated knowledge base querying and product information access.

Tech Stack: Python, Git, LangChain, Neo4j, Llama, NLP, Graph RAG, ChromaDB, llama.cpp, TinyLlama, WebAssembly, ARM Architecture.

Education

Brandenburgische Technische Universität Cottbus-Senftenberg   **Cottbus, Germany**
Master of Science in Artificial Intelligence   *10/2022 – present*

Key subjects:: Machine Learning, Deep Learning, Data Mining, Information Retrieval, Data Warehousing, Explainable ML, Computer Vision

Mahatma Gandhi University   **Kottayam, India**
Bachelor of Computer Applications   *2018 – 2021*

Key subjects:: Data Structures, Database Management Systems, Algorithms, Software Engineering, Computer Networks

Projects

Job Search Automation Bot:

GitHub:: `https://github.com/alwinpaul1/Job-Search-TG`
- ○ Built a **Telegram bot with Selenium automation** to streamline job searching and application tracking workflows.
- ○ Implemented **workflow automation** for data collection, parsing, and notification systems.
- ○ Deployed the bot for **24/7 operation** with scheduled task execution and error handling mechanisms.
- ○ Demonstrated proficiency in **Python automation, REST APIs, and bot development**.

Financial Analysis AI System:

GitHub:: `https://github.com/alwinpaul1/Financial_Crew`
- Designed and implemented a **4-agent CrewAI multi-agent system** (Query Parser, Code Writer, Code Execution, Code Reviewer) for complex financial analysis workflows.
- Integrated **FastMCP server functionality** for seamless Cursor AI assistant integration, creating extensible tools following industry-standard AI development protocols.
- Developed **NLP pipeline** using Ollama's deepseek-r1:7b model to parse queries and generate production Python code.
- Built automated workflows for real-time data processing and interactive visualization using yfinance API and matplotlib.

SmartTuner: GRPO Reinforcement Learning System:

GitHub:: `https://github.com/alwinpaul1/SmartTuner`
- Implemented **Group Relative Policy Optimization (GRPO)** algorithm for training small language models (135M-600M parameters) to perform logical reasoning tasks.
- Developed complete **RL pipeline** with experience collection, advantage calculation, and PPO clipped surrogate loss implementation achieving $46\% \rightarrow 60\%+$ accuracy improvements.
- Built **supervised fine-tuning (SFT) system** with LoRA adapters for parameter-efficient training, generating synthetic reasoning data via OpenAI API integration.
- Created comprehensive **visualization suite with real-time training monitoring** and engineered modular CLI system with configurable hyperparameters.

AI/ML Football Analysis System:

GitHub:: `https://github.com/alwinpaul1/AI-ML-Football-Analysis-System`
- Implemented **YOLO-based object detection** and ByteTrack for robust tracking in video analysis.
- Utilized **K-Means clustering and Optical Flow** techniques for performance optimization in dynamic environments.
- Processed large-scale video datasets with **computer vision algorithms** and developed performance metric modules.

Achievements

Google Cloud Program: 08/2020 – 11/2020
- Completed advanced coursework in cloud computing, application development, big data, and ML model deployment using Google Cloud tools.
- Strengthened understanding of large-scale, distributed AI systems powering global applications like Google Search, Gmail, and YouTube.

Skills

- **Programming & Tools:** Python, JavaScript, Git, Docker, Linux, macOS, Windows, CLI Development
- **AI Tools & Frameworks:** ChatGPT, Claude, LangChain, PyTorch, TensorFlow, Transformers, Hugging Face, CrewAI, Ollama
- **Agent Development:** Multi-Agent Systems, Graph RAG Systems, Intent-Based Chatbots, NLP Pipelines, LLM Fine-tuning
- **Vector & Graph Databases:** Neo4j, ChromaDB, Pinecone, FAISS, Knowledge Graph Construction
- **Automation & Integration:** n8n, REST APIs, Selenium, Workflow Automation, Bot Development
- **Machine Learning:** Reinforcement Learning (PPO, GRPO), Computer Vision, Generative AI, Model Deployment
- **Data Science:** Data Analysis, Feature Engineering, Visualization (Matplotlib, Seaborn, Plotly)
- **Collaboration & Soft Skills:** Team-oriented communication, Agile workflows, Cross-functional collaboration, Quick learning of new technologies

Languages Known

German (A2, improving), English (C1)