Aathman Tharmasanthiran

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SUMMARY

Master's student at Purdue CS with **6+ years** of work and research experience in AI, Machine Learning and Software Engineering. Experienced in developing and deploying **highly scalable, production-grade distributed systems on Azure Cloud**. Actively **building LLMs from scratch as a side project** to gain hands-on experience with the latest LLM concepts, including model training, fine-tuning, and optimization. Currently working on Generative AI applications, including Large Language Models (**LLMs**), Vision Language Models (**VLMs**), and Retrieval-Augmented Generation (**RAG**), to build AI agents for real-world applications.

SKILLS

- **Programming Languages:** Python, R, C, C++, Java
- **AI/ML:** PyTorch, TensorFlow, Transformers, Hugging Face, LLMs, VLMs, RAG, Computer Vision, Natural Language Processing, Reinforcement Learning, MLOps
- **Software Development:** Object-Oriented Programming, Event-Driven Architecture, Agile, Unit & Integration Testing, Distributed Systems, Networking, Compiler Optimizations, MySQL, REST API development
- **Others:** Linux, Docker, Azure Cloud, Vector Databases, LangChain, ROS, NumPy, Pandas

EXPERIENCE

Software Engineer-Machine Learning | WSO2 LLC (Branch of WSO2, Santa Clara, CA, USA) Apr 2021-Jul 2023

- **Led the development** of highly scalable distributed architectures for multiple products, including an **MLOps pipeline,** real-time alert notification system, and AI-powered code suggestion system in **Azure Cloud**.
- Built an MLOps pipeline that automated the full ML lifecycle—data preprocessing, training, evaluation, and deployment—reducing update cycles from days to just 1 hour.
- Worked with Agile methodologies, collaborating with cross-functional teams, and conducting unit/integration tests to ensure high-quality delivery.

Graduate Student Researcher (LyoHub) | Purdue University Nov 2024-Present

- Deployed a scalable, interactive **RAG chatbot** in a **Kubernetes environment**, supporting multi-user access, and integrated a domain-specific knowledge base for lyophilization.
- Developed an **AI-based visual inspection system** for detecting defects in freeze-dried pharmaceutical products, enhancing quality control through **computer vision** techniques.

Graduate Student Researcher (e-Lab) | Purdue University May 2024-Present

- Conducted research on **Vision-Language Agents** that assist users by perceiving and interacting with environments.
- Fine-tuned **Vision-Language Models (VLMs)** like LLaVA-Interleave and **LLMs** like Llama3.2 for improved object recognition and reasoning tasks.

PROJECTS

Creating and deploying an LLM model from scratch | Purdue University Jan 2025-Present

- Built a mini LLM from scratch, including small-scale pretraining, Supervised Fine-Tuning (**SFT**), Reinforcement Learning with Human Feedback (**RLHF**) and Proximal Policy Optimization (**PPO**) for model alignment.
- Implemented Parameter-Efficient Fine-Tuning (**PEFT**) methods such as **LoRA** and **QLoRA** to reduce fine-tuning costs.
- Optimized model efficiency using **mixed-precision training** and Post-Training Quantization (**PTQ**) techniques like **GPTQ**, reducing model size while maintaining accuracy for real-world deployment.

EDUCATION

Purdue University, West Lafayette, IN Aug 2023-Dec 2025

M.Sc. in Computer Science *(Specializing in AI & Machine Learning)* (expected)

University of Moratuwa, Sri Lanka Oct 2016-Mar 2021

B.Sc. Engineering (Hons) in Computer Science and Engineering