SAMHITA MAHADEVAN

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EDUCATION

Purdue University **Aug 2023 – May 2025**
Masters of Science in Computer Science *West Lafayette, IN*

College of Engineering Guindy, Anna University **July 2019 – June 2023**
Bachelor of Engineering in Computer Science and Engineering *Chennai, India*

WORK EXPERIENCE

Graduate Research Assistant **August 2024 – Present**
Computer and Information Technology, Purdue University

- Collaborated with NASIC (National Air and Space Intelligence Center) on the development of a digital forensics case website.
- Devised and implemented proof of concept for content preview of files without unzipping drive image, streamlining process and decreasing data processing time by 20%.
- Led the integration of LLM-generated tags for each case file, improving data organization and retrieval efficiency.
- Integrated Ollama within the server, enabling automatic generation of LLM-based file summaries for PDF files.

Software Engineer Intern **June 2024 – August 2024**
Striim Inc

- Integrated Half Space Trees (HST) and Robust Random Cut Forest (RRCF) in Striim, boosting real-time anomaly detection efficiency by 30% and elevating accuracy by 25% in evolving data streams.
- Executed the deployment and configuration of transaction log analytics (TLA) for the latest Striim version, ensuring seamless integration and thorough validation of anomaly detection algorithms within TLA.

Artificial Intelligence Intern **February 2024 – April 2024**
Deep Cognition Inc

- Applied Multi-Agent LLMs to enhance document validation processes, improving accuracy by 35% and automating 60% of the manual validation tasks.
- Developed and implemented AI agents that automate web-based tasks such as validating PDF form contents and optimizing OCR operations, streamlining document processing workflows and reducing manual intervention by 50%.

PROJECTS

Co-op LLM: LLMs Working Together to Play Chess | *Python* **January 2024 - May 2024**

- Formulated a method to merge two large language models (LLMs) using spherical linear interpolation (SLERP) to boost AI chess performance.
- Implemented a debate-style mechanism for LLMs to collaboratively decide on chess moves, refining strategic reasoning.
- Achieved a 15% performance improvement in AI chess gameplay through thorough evaluations against state-of-the art chess AIs.

Improving LLM Code Generation Robustness | *Python* **January 2024 - May 2024**

- Engineered a novel approach to enhance LLM code security by integrating vulnerability detection with reinforcement learning, effectively diminishing code vulnerabilities by 30%.
- Leveraged advanced datasets for fine-tuning, addressing dataset imbalances and diversifying exposure to security flaws.
- Generated synthetic vulnerable code via the SvenVul model for LLM pre-training, tackling the imbalance in real-world datasets and reducing false-postive rates by 20% .

3D Face Reconstruction using a single RGB image | *Python* **November 2022 - May 2023**

- Created a self-supervised 2D-to-3D conversion model that reached 90% accuracy across 2,000 tested images.
- Enhanced training efficiency by 30% through the incorporation of VGGFace and Pix2Pix networks.
- Attained a 5% error rate in extracting age, expression, and ethnicity information from a dataset of 200,000 images.

PUBLICATIONS

- Samhita Mahadevan, Ishwarya Sriram, Bhagavathi Ravikrishnan **ARDL-IDS: Adversarial Resilience in Deep Learning-based Intrusion Detection Systems**. In *2023 International Conference on Wireless Communications Signal Processing and Networking (WiSPNET)*, 2023, IEEE.

TECHNICAL SKILLS

Languages: Python, Java, C++, C, HTML/CSS, JavaScript, SQL
Developer Tools: VS Code, Eclipse, Google Cloud Platform, Jupyter Notebook, AWS, HuggingFace
Technologies/Frameworks: Linux, Docker, GitHub, PyTorch, TensorFlow