

Vivek Raj

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EDUCATION

Binghamton University | Thomas J. Watson College of Engineering and Applied Science, NY

Master of Science in Computer Science, **Artificial Intelligence (AI) Track** GPA: 4.0/4.0 Jan 2024 - May 2025

Binghamton University | Thomas J. Watson College of Engineering and Applied Science, NY

Bachelor of Science in Computer Science GPA: 3.8/4.0 (Dean's List) Aug 2021 - Dec 2023

TECHNICAL SKILLS

- **Programming Languages:** Python, C++, C, Linux, Java, SAP/ABAP
- **Libraries & Frameworks:** PyTorch, Scikit-Learn, **Large Language Models**, Transformer, Tensorflow
- **Technologies:** Machine Learning, Deep Learning, Neural Networks, Reinforcement Learning
- **Coursework:** Machine Learning, System Programming, **Artificial Intelligence**, Operating Systems, Adv Computer Architecture, Computer Security, Design and Analysis of Algorithms, **Human-Computer Interaction**

PROFESSIONAL EXPERIENCE

Binghamton University, Teaching Assistant (CS) | Binghamton, NY

Aug 2024 - Present

- Assisted 100+ undergrad and graduate students in **Computer Security**, demonstrating strong communication skills
- Provided support in understanding core concepts, including **cryptography** and **networking**
- Evaluated assignments and projects with constructive feedback to help students improve their understanding
- Communicated effectively during office hours to explain complex topics, ensuring clarity for students

Research Assistant | Binghamton, NY

Feb 2024 - May 2024

- Worked as a research assistant with an emphasis on prompt engineering to enhance AI's to respond to different tasks
- Tested various prompt styles and analyzed AI model outputs to identify patterns for optimization.
- Developed more accurate responses through rigorous testing of **machine learning models** and **retrieval-augmented generation**.

Central Hudson Gas and Electric Corp, Software Intern | Poughkeepsie, NY

June 2022 - Aug 2022

- Enhanced **SAP system integration** by leading the development of 4 **ABAP programs** for SAP HANA.
- Improved data management and analysis capabilities to support critical business decisions.
- Boosted system performance by 30% through the design of **CDS views** in Eclipse ADT.

PROJECT EXPERIENCE

NeoVision | Git

October 2024 - November 2024

- Built an **Android app** for real-time **handwriting recognition**, **object detection**, and **multilingual text processing**.
- Used **PaddleOCR**, **YOLO**, and **Google API** to detect text and objects like **packages**, **signs**, and **labels**.
- Implemented **OpenCV** for preprocessing with live **confidence score displays** for fast and accurate results.
- Enhanced tasks like **note-taking**, **document digitization**, and **accessibility tools** with AI-driven solutions.

ConcurrentTextAnalyzer (Map-Reduce for Text Processing) | Git

April 2024

- Designed and implemented a **multithreaded map-reduce framework** in C, capable of reading and processing large text files by dividing them into segments for **parallel processing**, reducing processing time by 50%
- Developed and managed 8 worker threads to concurrently count letters and words within text segments. This approach increased processing speed by 40%, significantly improving overall efficiency
- Enhanced text analysis performance by applying map-reduce logic, enabling efficient handling of large data volumes

Air Mouse (Hackthon Winner) | Git

February 2024

- Developed '**GestureControl**', a real-time hand gesture recognition system using **MediaPipe** and **TensorFlow**, achieving 97% accuracy in custom gesture detection and 3D hand tracking
- Programmed the server in Python using **TensorFlow** and **MediaPipe** for real-time gesture tracking, and the client in React.js for responsive UI control
- Optimized the pipeline for real-time performance, reducing latency by 50% through parallel processing and integration of MediaPipe's hand landmark detection framework

CERTIFICATES

- **Software Engineering Virtual Experience (JPMorgan Chase & Co.)**
- **Cybersecurity Virtual Experience Program (JPMorgan Chase & Co.)**

July 2023

June 2023