Avitej Iyer

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Education

Pennsylvania State University – **M.S in Computer Science**	May 2026

GPA: 3.77/4.00

Pennsylvania State University – **B.Sc in Computer Science**; Minor in Mathematics	May 2024

GPA: 3.86/4.00, Graduated **Cum Laude**

Skills

Languages: Python, JavaScript, Go, C#, C++, HTML, CSS
Developer Tools: Unity, Git, MySQL, Postman, Docker, AWS (Lambda, S3, DynamoDB, Bedrock), LaTeX
Technologies/Frameworks: LangChain, Hugging Face, Keras, TensorFlow, Scikit-learn, LoopBack, Node.js
Certifications: AWS Certified Cloud Practitioner

Experience

Research Assistant, Pennsylvania State University   Aug 2024 – Present
- Architecting a dockerized AI-driven pipeline for novel gene function discovery, utilizing LangChain for agentic workflows, vLLM for efficient LLM inference, and Biopython for genomic data processing
- Developing and implementing an iterative LLM self-correction mechanism to significantly improve the quality of mechanistic hypotheses generated from complex, large-scale gene and Gene Ontology (GO) datasets
- Integrating knowledge graph (e.g., INDRA) retrieval with LLM reasoning to provide mechanistic context for under-characterized genes, enhancing the system's discovery potential beyond standard RAG
- Fine-tuning LLMs (TRL, Unsloth) on domain-specific data for improved biological interpretation & hypothesis generation

Generative AI and Machine Learning Intern, Waters Corporation – Milford, MA   May 2024 – July 2024
- Developed an AI-driven chatbot trained on company user manuals and guides with LangChain and AWS services as part of a team using Agile practices
- Contributed to implementing scalable, fault-tolerant retrieval mechanisms with OpenSearch and modified document retrieval mechanisms in the RAG pipeline
- Developed AWS Lambda with BeautifulSoup and Numpy for processing scraped HTML for RAG ingestion

Capstone Team Lead, RERC on AAC at Penn State – State College, PA   Aug 2023 – Jan 2024
- Developed an AR navigation app in C# with GPS integration using Unity for individuals with disabilities, integrating real-time object recognition with YOLOv4.
- Built robust UI (Unity AR Foundation/XR) with storage for frequently used objects/paths
- Managed team workflow for 4 members using Trello and Git, ensuring on-time project deliverables

Software Engineering Intern, Valuefy – Remote   May 2023 – Aug 2023
- Participated in transitioning a monolithic trading codebase to microservices architecture using Loopback, reducing update downtime by 20%.
- Developed RESTful APIs for trade synchronization between accounts using Bluebird, and validated them using Postman.
- Automated client-facing financial report generation with Python, significantly enhancing data processing efficiency.

Projects

Matlab Computer Vision Projects   https://github.com/avitej-iyer/Computer_Vision_Projects
- Implemented 3D motion capture pipeline: projection, triangulation, reconstruction & fundamental matrix computation
- Built motion detection framework (4 algorithms, e.g., Adaptive Background Subtraction) for real-time comparative video analysis

Image Captioning Model pipeline   github.com/avitej-iyer/CapDec-Recreation
- Created a pipeline to train a decoder on frozen CLIP text encoder (textual data only) & implemented noise injection to align textual/visual embedding spaces.

Task Management Board   https://github.com/avitej-iyer/task_management_board_prime_frontend
- Developed a full-stack task management app with React (TypeScript) and Node.js, featuring a responsive UI with Bootstrap and drag-and-drop functionality via React Beautiful DnD.
- Designed a secure authentication system with JWT and bcrypt.js, ensuring robust user data protection.
- Built a RESTful API with Express.js and MongoDB Atlas, enabling efficient CRUD operations and data persistence.