Vishnupriya Swaminathan

swamina3@buffalo.edu | +1 (716)986-3659 | |

https://www.linkedin.com/in/vishnupriya-swaminathan-b4517222a/ | https://github.com/Vishnupriya-1008

Education

University at Buffalo, The State University of New York Aug 2024 – Jun 2026

- Master of Science in Artificial Intelligence;
- **Areas of Interest:** Data Structures & Algorithms, Database Systems, Object-Oriented Programming, Distributed Systems, Machine Learning, Reinforcement Learning.

Experience

IBM, Application Developer – Chennai, India Mar 2023 – Aug 2024

- Developed a dynamic and responsive customer portal for the UPS project at IBM using React.js, ensuring seamless user experience and intuitive design.
- Designed and implemented robust backend services with Node.js, Express.js, and MongoDB, leveraging Mongoose ODM to streamline database operations and enhance efficiency.
- Optimized frontend performance, reducing page load time by 60% (from 25ms to 10ms) through advanced React optimization techniques, code splitting, and efficient state management.
- Established CI/CD pipelines with Jenkins and Docker, automating build and deployment processes and shortening release cycle time by 40%
- Implemented unit and integration tests for both frontend and backend using Jest and Mocha, increasing code coverage to 85% and reducing production defects by 25%.

Projects

AptitudeAI: Intelligent Screening Agent | Reinforcement Learning, OpenAI Gym, PyTorch github

- Built a custom adaptive interview environment tracking candidate accuracy, progress, and skill score from a merged aptitude/programming question bank. Co-trained dual DQN agents for difficulty and domain selection using greedy exploration and entropy regularization.
- Achieved a 20 % increase in cumulative reward over a static baseline.

Predicting Alzheimer's Disease Progression using Biomarker Analysis and Causal Modeling | Python, Scikit-learn, PyTorch, hmmlearn, UMAP, NLME Modeling. github

- Transformed ADNI biomarkers (ABETA, TAU, PTAU, FDG PET, APOE4) into normalized inputs for unsupervised clustering (K-Means, GMM, hierarchical) and HMM temporal modeling to discover progression subtypes.
- Trained RF and MLP classifiers (63% accuracy) to predict CN/EMCI/LMCI/AD stages, used UMAP for 2D visualization of latent clusters, and validated APOE4 <-> ABETA causal links.
- proposed federated learning and differential privacy to ensure ethical data handling.

Traffic Violation Detection System |YOLOv5, YOLOv8, DeepSORT, MediaPipe, EasyOCR, OpenCV, PyTorch github

- Built a real-time pipeline for vehicle, helmet, and license plate detection, multi-object tracking, pose estimation, and OCR to flag helmet, posture, overloading, and license plate violations with annotated outputs and logged infractions.

Technologies

Languages: Python, C++, HTML, CSS, JavaScript.

Frameworks: React.js, Node.js, Express.js, Handlebars, Bootstrap, Material UI, Context API, JSON Web Token

Databases & Libraries: MySQL, MongoDB(NoSQL), PostgreSQL

DevOps/Cloud: Git, Firebase, GCP, Docker

Tools & Technologies: RESTAPIs, Postman, WebSockets, OAuth, , Tableau, Google Dialogflow
Artificial Intelligence(AI) technologies: scikit-learn, Pandas, TensorFlow, Pytorch, Numpy, Scipy, classical machine learning models, Deep learning models, NLP, Gen AI for text, dimensionality reduction, XAI(Explainable AI)