AJAY VIKRAM PERIASAMI

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EDUCATION

Duke University, Durham, North Carolina   **Aug 2025 - Present**
Master of Science in Computer Science (Artificial Intelligence / Machine Learning specialization)
Relevant coursework: Introduction to Deep Learning, Theory & Algorithms of Machine Learning, Building Intelligent Agents

National Institute of Technology Karnataka, Surathkal, Mangaluru, India   **Dec 2020 - Apr 2024**
Bachelor of Technology, Computer Science and Engineering, GPA: 9.46 **[Ranked 4/130]**
Relevant coursework: Machine Learning, Deep Learning, Digital Image Processing

RESEARCH EXPERIENCE

Graduate Research Assistant, Duke Institute for Brain Sciences, Duke University   **Sept 2025 - Present**
- Working on Deep Learning techniques for Functional Magnetic Resonance Imaging (fMRI) analysis.

Machine Learning Research Intern, Indian Institute of Science (IISc), Bengaluru   **May 2024 - July 2025**
- Developed an asynchronous satellite tracking algorithm using event-based clustering, optimized for real-time inference on ARM Cortex-A72 and Cortex-M7 processors.
- Ternarized CNNs from 32-bit to 2-bit for Human Activity Recognition on Radar data, achieving 16x memory compression with only a 0.5% accuracy drop.
- Participated and ranked 5th in the IEEE BioCAS 2024 Grand Challenge: Trained, efficient LSTM models for neural decoding in non-human primate motor control.
- Explored the potential of State Space Models like S4, LMU, and Mamba, training them on diverse real-world datasets for gesture, speech emotion, and human activity recognition, and quantized the model to 8-bit.
- Technologies used: Python, C, PyTorch, Metavision SDK.

WORK EXPERIENCE

Machine Learning Intern, Lamarr, Remote   **Mar 2024 - Apr 2024**
- Developed a Draft Bot that fetches relevant legal document templates based on user prompts, auto-generates placeholders for customization, and allows downloads in Word and PDF formats.
- Performed backend fixes for integrating Table Transformer and TrOCR into the existing codebase.
- Fine-tuned the Qwen1.5-14B model for a custom dataset, optimizing model performance for specific tasks.
- Developed a SalesGPT agent for automating timed email communication with users and promoting services.
- Technologies used: Python, LangChain, Llama Factory.

Software Intern, Qualcomm, Hyderabad   **May 2023 - July 2023**
- Developed and optimized a memory analysis tool, resulting in 85% faster processing and 75% memory savings.
- Improvements made include automation of the entire pipeline, faster loading, cloud-based deployment, enhanced UI, authentication, user notification, and load balancing.
- Simplified the user process to just provide a changelist ID and receive memory analysis notifications via email.
- Enhanced UI with memory graphs, memory organization in a tree layout, filtering, and sorting for better interpretability.
- Automated the pipeline with Jenkins, deployed using Docker + Kubernetes with authentication and load balancing.
- The tool was widely adopted across teams and led to a full-time offer based on performance.
- Technologies used: Python, Vite, React, Node, MongoDB, Jenkins, Docker, Kubernetes.

RESEARCH PROJECTS

Autonomous Driving on CARLA | Python, PyTorch, CARLA [Team: 3, Role: Lead]   **Oct 2023 - Mar 2024**
- Developed ViTFuser, an efficient model for self-driving on the CARLA simulator, improving the base model.
- Achieved a 26% increase in driving score by integrating stage-wise fusion between CNN backbones and ViT transformers for feature extraction, with a Feature Pyramid Neck (FPN) component for improved object detection.
- Achieved a 67% reduction in memory usage compared to the baseline model.

Breast Cancer Detection in Mammograms | Python, TensorFlow [Team: 2]   **Sept 2023 - Dec 2023**
- Collaborated with a Ph.D. student to detect breast cancer and predict BI-RADS scores from digital mammograms.
- Explored CNN and transformer-based approaches, focusing on patch-wise ROI training and detection.
- Improved model accuracy from 65% to 75% by leveraging transformer-based architectures.

Credit Card-Based Market Segmentation | Python, PySpark, Tensorflow[Team: 2, Role: Lead]   **Aug 2023 - Dec 2023**
- Developed an end-to-end clustering solution for financial data to segment credit card users by behavior.
- Utilized Apache Spark for scalable data processing, reducing computation time on large datasets.
- Enabled detailed customer profiling for targeted marketing through interpretable cluster analysis.

Social Engineering and Fake News Ontology | Python, Onto4All [Team: 2, Role: Lead]   **Feb 2023 - April 2023**
- Designed a domain ontology to detect social engineering attacks via fake news.
- Developed key taxonomies, relationships, and rules to identify misinformation patterns.
- Created a structured framework for automated detection and online security solutions.

ACADEMIC PROJECTS

Furniture Trial App | Flutter, ARCore [Team: 2, Role: Lead]   **Sept 2022 - Dec 2022**
- Developed an Augmented Reality-based app to visualize furniture in live environments.
- Designed using a Model Driven Architecture (MDA) consisting of the Computation-Independent, Platform-Independent, and Platform-Specific models.

Indian Judiciary Management System | HTML, CSS, JavaScript, PHP, MySQL [Team: 3, Role: Lead]   **Feb - May 2022**
- Developed a website to digitalize judiciary activity routines with features such as filing/scheduling cases, appointing judges, finding/requesting lawyers, and adding/modifying/deleting laws.

Operating System Simulator | HTML, CSS, JavaScript [Team: 10]   **Mar 2022 - May 2022**
- Developed a website to visualize operating system concepts.
- Developed a simulator for page replacement algorithms, such as FIFO, Optimal, LRU, MRU, and Random.

Stuck At Faults Simulator | HTML, CSS, JavaScript [Team: 5]   **Sept 2021 - Dec 2021**
- Developed a website hosting a virtual lab to detect faults in logic gates.
- Created simulators demonstrating SA0 and SA1 faults in NAND and NOR logic gates.

PERSONAL PROJECTS

Handwritten Digit Predictor App | Flutter, TensorFlow Lite, Python   **Oct 2023 - Nov 2023**
- Developed a mobile app for handwritten digit recognition, supporting image upload, and interactive on-screen drawing.

YouTube Assistant | Python, LangChain   **Mar 2024 - Apr 2024**
- Developed a tool to transcribe YouTube videos and answer video-related questions.
- Implemented a summarization feature for quick content review and enhanced video navigation.

TECHNICAL SKILLS
- **Programming Languages**: Python, C, C++, JavaScript
- **Machine Learning**: TensorFlow, PyTorch, LangChain, MATLAB, Brevitas
- **Web Development**: HTML/CSS, React, Node.js
- **Database Management**: MySQL, MongoDB
- **Development Tools**: Docker, Visual Studio Code, Git, Kubernetes

CERTIFICATIONS
- Mathematics for Machine Learning: Linear Algebra | [Coursera](#)   **Feb 2024**
- Identify Damaged Car Parts with Vertex AutoML Vision | [Coursera](#)   **Jan 2024**
- Introduction to Computer Vision with TensorFlow | [Coursera](#)   **Jan 2024**
- Fraud Detection on Financial Transactions with Machine Learning on Google Cloud | [Coursera](#)   **Jan 2024**
- Postman API Fundamentals Student Expert | [Postman](#)   **Aug 2023**
- Unsupervised Learning, Recommenders, Reinforcement Learning | [Coursera](#)   **Mar 2023**
- Automatic Machine Learning with H2O AutoML and Python | [Coursera](#)   **Mar 2023**
- Supervised Machine Learning | [Coursera](#)   **Feb 2023**
- Advanced Learning Algorithms | [Coursera](#)   **Feb 2023**
- IoT, Robotics and Embedded Systems | [Inmovidu](#)   **Jan 2021**

PUBLICATIONS
- **Ajay Vikram P**, Atanu Chatterjee, et al. "ViTFuser: Advancements in Global Context for Autonomous Vehicles," *6th International Conference on Machine Learning, Image Processing, Network Security, and Data Sciences (MIND 2024)* (accepted).
- Shankaranarayanan H, Satyapreet Singh Yadav, Adithya Krishna, **Ajay Vikram P,** Mahesh Mehendale, Chetan Singh Thakur. "HOMI: Ultra-Fast EdgeAI Platform for Event Cameras," *IEEE Transactions on Circuits and Systems for Artificial Intelligence* (under review).

POSITIONS OF RESPONSIBILITY
Placement Coordinator | Career Development Center, NITK (Jun 2023 - Apr 2024): Facilitated communication between prospective employers and students. Managed the end-to-end placement process, coordinating logistics, schedules, and requirements. Arranged special programs and events to develop technical skills based on industry feedback.

EXTRACURRICULAR
Volunteer Mentor | Team Everest NGO, Remote   (Feb 2024 - Mar 2024): Provided one-on-one mentorship to a student, focusing on leadership development. Facilitated discussions and activities to enhance leadership skills such as communication, decision-making, and problem-solving.

AWARDS
- Ranked 3rd in school in Class 10 ICSE Board Examinations; achieved a perfect score of 100/100 in Computer Science.
- Awarded the Annual Proficiency Prize for Academic Excellence for 7 years in a row.