Venu Dattathreya Vemuru

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EXPERIENCE

- **Graduate Research Assistant — Genomic Prediction of Soybean Yield** Jan 2025 - Present
  University of Georgia *Athens, GA*
  - Engineered a scalable dimension reduction pipeline for high-dimensional DNA sequence data, implementing Gaussian Process models with distributed computing that improved prediction accuracy by 23%.
  - Developed optimized Python data preprocessing algorithms for genetic sequences, implementing NumPy vectorization that reduced processing time by 65% while ensuring cross-dataset model performance.
  - Implemented multiple dimensionality reduction techniques (PCA, t-SNE, UMAP) with scikit-learn hyperparameter tuning to identify the most efficient approach for genomic data visualization.
- **Graduate Research Assistant — Automated Maize Brace-Root Phenotyping** Jan 2025 - Present
  University of Georgia *Athens, GA*
  - Designed computer vision system using PyTorch and OpenCV for agricultural phenotyping, improving maize root segmentation accuracy from 47% to 71% through optimization of U-Net architecture.
  - Established deep learning pipeline including transfer learning and data augmentation techniques that reduced analysis time by 35% compared to manual methods.
  - Architected data processing solution with Python that resolved complex JSON annotation formats and data integrity challenges for distributed machine learning model training.
- **Cybersecurity Intern** Feb 2023 - Mar 2023
  Corizo *Bengaluru, India (Remote)*
  - Identified 50+ vulnerabilities using Nmap, Burp Suite and Metasploit; implemented patches improving security by 25% and developed automation reducing manual effort by 40%.

PROJECTS

- **Flight Booking System** - *Java, Spring Boot, JPA/Hibernate, MySQL, JWT* Aug 2025
  - Architected and implemented a Java Spring Boot flight reservation system with REST APIs and MVC design pattern, achieving 99% system availability while handling concurrent user requests through efficient thread management.
  - Engineered secure user authentication using Spring Security and JWT integration, implementing role-based access control that reduced unauthorized access attempts by 30% while maintaining API response times under 200ms.
  - Designed scalable data persistence layer with JPA/Hibernate and MySQL, optimizing complex flight search queries that improved system performance by 35% through strategic database indexing and query optimization.
- **Image Caption Generator** - *TensorFlow, VGG16, LSTM, Python* Dec 2024
  - Created image captioning system combining VGG16 CNN for feature extraction and LSTM networks, achieving BLEU-1 score of 0.64; processed 8,000+ images extracting 4096-dimensional vectors.
  - Developed custom data generator with Keras/TensorFlow, implementing checkpoint-based training reducing model loss from 6.36 to 3.96 with 8,700+ word vocabulary.
- **E-Cinema Booking System** - *React, Node.js, Express, MongoDB, JWT* Feb 2025
  - Architected a comprehensive full-stack web application providing interactive digital experiences for movie browsing and booking, implementing modern UI design patterns and responsive layouts that enhanced user engagement.
  - Engineered dynamic seat selection interface with client-side rendering optimizations, reducing load times by 40% while maintaining a seamless, visually compelling user experience.
  - Developed modular, reusable frontend components and backend microservices with thorough test coverage, ensuring 99.9% uptime and 1000+ concurrent users support through clean, maintainable code and efficient algorithms.
- **Student Face Recognition System** - *Python, Flask, React, OpenCV* Jan 2025
  - Designed and implemented a full-stack application leveraging computer vision for real-time student identification, creating an intuitive user interface with React that visualizes complex data and provides seamless user interactions.
  - Built scalable microservices architecture with RESTful APIs connecting frontend experience to backend processing, implementing efficient data flow patterns and responsive feedback mechanisms.
  - Containerized application using Docker with CI/CD pipeline for continuous deployment, ensuring reliable delivery of new features while maintaining 95%+ system accuracy and intuitive user experience.

TECHNICAL SKILLS

Languages: Python, Java, JavaScript, SQL
ML/AI: TensorFlow, PyTorch, Scikit-Learn, Keras, NLP
Data Engineering: NumPy, Pandas
DevOps: Docker, CI/CD, Kubernetes

EDUCATION

- **University of Georgia** — Athens, GA
  Master of Science in Computer Science — *Aug 2024 - May 2026 (Expected)*
- **RMK Engineering College** — Chennai, India
  Bachelor of Science in Computer Science — *Aug 2020 - May 2024*

PUBLICATIONS

- **IEEE ICRMKM-AI** — Jan 2024
  - Vemuru, V.D., et al. Enhancing Image Deblurring Algorithm Selection and Performance Evaluation for CCTV.
  - Vemuru, V.D., et al. Securing Children Based on IoT and Emotion Prediction.
  - Vemuru, V.D., et al. AI-Powered Visual Aid System for the Blind.