

Venkata Vivek Panguluri

Athens, GA 706-461-5728 venkatavivekp@gmail.com
[LinkedIn](#) | [GitHub](#)

Professional Summary

Computer Science graduate student with research and engineering experience across machine learning, cybersecurity, and scalable software systems. Currently serving as a Student Lab Assistant in the University of Georgia's GAIM Lab, contributing to deep-learning methods for statistical weather downscaling and severe-weather risk assessment. Built reproducible ML pipelines, simulation-driven systems, and full-stack platforms, with two IEEE publications in IoT anomaly detection and uncertainty-aware risk modeling.

Education

University of Georgia

M.S. Computer Science GPA: 3.86/4.00 | 4th Semester (Ongoing)

Jan 2025 – Dec 2026

Athens, GA

R.M.D Engineering College

B.E. Computer Science

Aug 2020 – May 2024

Chennai, India

Experience

[University of Georgia — GAIM Lab](#)

Aug 2026 – Present

Student Lab Assistant — Deep Learning for Statistical Downscaling

Athens, GA

- Contributing to active GAIM Lab research on deep-learning methods for statistical weather downscaling, supporting high-resolution forecasting and severe-weather risk assessment over the southeastern United States.
- Extended the lab's existing PyTorch downscaling framework with a configurable Enhanced U-Net backbone, enabling controlled architecture experiments through Hydra-based model configuration.
- Implemented PyTorch Lightning checkpointing and training-resume workflows to support long-running experiments, preserve best-performing models, and recover interrupted training without restarting from scratch.
- Developed and validated HRRR data-preparation components for manifest generation and normalization, establishing the preprocessing foundation for paired HRRR/GFS downscaling experiments.
- Built regression tests with pytest and contributed within a reproducible research workflow using PyTorch, PyTorch Lightning, Hydra, xarray, Herbie, Git, Linux, and HPC-oriented training pipelines.

R.M.D Engineering College

2024

Research Intern — IoT Security and Machine Learning

Chennai, India

- Designed and deployed end-to-end ML pipelines for IoT intrusion detection, transforming high-volume network telemetry into actionable real-time anomaly signals for operational monitoring.
- Engineered temporal, behavioral, and protocol-level feature representations to detect multi-vector attack behavior across heterogeneous IoT devices and network environments.
- Evaluated Random Forest, SVM, and ensemble models to balance detection accuracy, computational efficiency, and real-time deployment feasibility.
- Published [IEEE research](#) demonstrating improved detection precision and measurable reduction in false positives under dynamic network conditions.

R.M.D Engineering College

2024

Research Intern — Supply Chain Analytics and Risk Modeling

Chennai, India

- Built probabilistic simulation frameworks to model supply chain behavior under uncertainty, including disruption scenarios, demand variability, and operational constraints.
- Developed decision-tree and NPV-based optimization models to compare supply chain alternatives and quantify financial risk across global operating conditions.
- Performed scenario-driven analysis to identify stable, cost-efficient strategies under volatility and improve risk-aware operational decision-making.
- Co-authored [IEEE-indexed research](#) on uncertainty-aware risk modeling for complex supply systems.

Projects

Context-Aware Cross-Domain Recommendation System

React, Node.js, Express, JavaScript

- Developing a local full-stack recommendation system that connects food, fitness, and media domains using contextual signals, interaction history, and explainable adaptive scoring.
- Designed modular Node.js backend services for candidate generation, scoring, feedback ingestion, cross-domain mapping, dashboard summaries, and recommendation APIs.
- Implemented feedback-driven ranking using actions such as selected, saved, helpful, ignored, and not interested to adjust future recommendations over time.
- Built lightweight cross-domain logic that transfers behavior between food and fitness, enabling activity-aware outputs such as workout-to-nutrition recommendations.
- Strengthened backend reliability with validation, fallback data handling, safe error responses, request logging, local datastore recovery, and lightweight rate limiting.
- Created repeatable validation flows that simulate user feedback patterns and generate before/after recommendation results for report evaluation.

Robust Earth Forecast

Python, PyTorch, ConvLSTM, CNN

- Built a spatiotemporal deep learning pipeline mapping coarse ERA5 reanalysis fields to high-resolution PRISM temperature grids for regional climate downscaling.
- Trained CNN and ConvLSTM models across multiple input sets and temporal histories to study how sequence-based climate inputs affect forecasting accuracy.
- Reduced prediction error from RMSE 2.37 to 1.57 with ConvLSTM-based modeling, achieving approximately 33% improvement over persistence baselines.
- Designed reproducible experiment workflows using controlled train-validation splits, training-only normalization, structured logging, and repeatable model evaluation.
- Reported results with stability checks across multiple seeds, treating model performance as a trend-based finding rather than a single-run claim.

Adaptive Network Security System

Java, Spring Boot, React

- Engineered a full-stack adaptive cybersecurity platform modeling secure communication as an attack-defense-recovery game with risk-based escalation.
- Implemented security modes including AES-GCM, SHCS, CPHS, and ADAPTIVE mode selection driven by session behavior, threat signals, and challenge outcomes.
- Built a React command-center interface for sender, receiver, and admin workflows, surfacing security loadout, threat state, held messages, recovery status, and live system feedback.
- Evaluated attack-defense scenarios across multiple intensities, showing CPHS as the strongest resilience mode while preserving valid recovery paths without dead-end states.
- Integrated OWASP-aligned controls including HMAC integrity validation, replay protection, rate limiting, secure session handling, audit logging, and admin step-up workflows.

Certifications

Google Cloud Skill Badges

- Completed hands-on Google Cloud labs covering core infrastructure, cloud networking, environment configuration, and resource management.
- Automated infrastructure provisioning using Terraform, building reproducible deployment workflows for scalable cloud environments.
- Deployed and managed containerized applications on Google Kubernetes Engine with IAM, VPC networking, and secure infrastructure practices.
- Applied cloud infrastructure concepts to backend deployment, container orchestration, and distributed system design workflows.

Key Achievements

- Published two IEEE research papers spanning IoT anomaly detection and uncertainty-aware supply chain risk modeling.
- Achieved 33% reduction in regional climate prediction error using ConvLSTM-based spatiotemporal modeling.
- Built three end-to-end systems across recommendation engines, climate forecasting, and adaptive cybersecurity.
- Contributing to a research-grade deep-learning downscaling framework at UGA's GAIM Lab, including model architecture extensions, restartable training, automated testing, and HPC-oriented experimentation.

Technical Skills

- **Languages:** Python, Java, C, SQL, JavaScript
- **Frameworks and Libraries:** PyTorch, PyTorch Lightning, Hydra, React, Node.js, Express, Spring Boot, Scikit-learn, Pandas, NumPy, xarray
- **Tools and Platforms:** Git, Docker, Google Cloud Platform, Kubernetes, Terraform, Herbie, Linux, pytest, REST APIs
- **Domains:** Machine Learning, Deep Learning, Statistical Downscaling, Climate Forecasting, IoT Security, Network Security, Recommendation Systems, Supply Chain Analytics