Meghasyam Peddireddy

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EDUCATION

Iowa State University *Anticipated May 2026*
Bachelor of Science in Computer Science Ames, IA
Minors: Data Science, Applied Artificial Intelligence

TECHNICAL SKILLS

Programming Languages: Python, Java, C, C#, JavaScript, R, SQL
Web & Frameworks: React, Node.js, Express, Android Studio
Game Development: Unity, Godot (GDScript)
AI / ML: CNNs, LSTMs, Computer Vision, MediaPipe, Machine Learning Pipelines
Systems: Linux, macOS, Windows
Tools: Git, MySQL, ncurses, Google Workspace, Microsoft Office

PROJECTS

Pi-515 AI Innovation Challenge - 1st Place Winner ($5,000 Award) Jan 2025 – May 2025
Disease Detection in Plants - State of Iowa Challenge

- Designed and implemented an end-to-end machine learning pipeline for plant disease detection, with a primary focus on corn leaf diseases.
- Trained image classification models using large-scale agricultural datasets spanning multiple crops and disease categories, including curated and publicly available sources.
- Built a responsive React-based web interface enabling users to upload plant images and receive real-time disease classification results.
- Integrated the trained ML model with backend services to support efficient inference, data flow, and scalable deployment.
- Collaborated in a competitive innovation challenge environment, delivering a production-ready prototype recognized with first place at the state level.

AI-Assisted Compliance Rules Engine

- Designed and implemented a cloud-ready Java Based compliance evaluation service that validates structured records against configurable business rules stored in a SQL database, supporting required fields, numeric thresholds, regex validation, and allowed value constraints.
- Built RESTful APIs to manage rules, ingest records, evaluate compliance deterministically, and persist violations, emphasizing correctness, auditability, and production oriented design.
- Modeled relational schemas in PostgreSQL with appropriate constraints, indexes, and foreign keys to support scalable rule evaluation and violation tracking.
- Containerized the application using Docker and Docker Compose to enable consistent local development and production deployment.
- Deployed the service to AWS using managed database and compute services.
- Integrated an LLM-based explanation layer to generate human-readable summaries of compliance violations while keeping all decision logic deterministic and auditable.

Air Drawing: Real-Time Sketch Recognition System Jan 2025 - May 2025

- Designed and implemented a hybrid CNN-LSTM neural network for real-time sketch recognition achieving

99.79% test accuracy

- Trained the model on Google's Quick, Draw! dataset with over 1M samples using data augmentation and optimized preprocessing
- Implemented real-time hand tracking using MediaPipe with Kalman filtering for motion smoothing and pinch gesture detection
- Achieved sub-100ms inference latency on CPU, enabling interactive real-time user experiences
- Developed pattern completion algorithms to provide intelligent drawing suggestions

Ames Nocturne - Full-Stack Game Development Jan 2023 - Present

- Independently developing a full-stack 2D game, owning all system design, implementation, and integration across gameplay, UI, AI, physics, and data layers.
- Architected core game systems in Unity using C#, leveraging MonoBehaviours, ScriptableObjects, Tilemaps, and Animator state machines for modular and maintainable design.
- Implemented AI-driven NPC behavior using finite state machines (FSM) for patrol, chase, and idle states, with adaptive logic responding to player proximity and difficulty scaling.
- Designed and implemented procedural content generation for map layouts, NPC spawn points, and obstacles using seed-based randomness to enable reproducible and replayable levels.
- Developed custom pathfinding and collision systems integrated with Unity physics to support dynamic NPC movement and environment interaction.
- Built a local data persistence layer using JSON configuration files and ScriptableObjects to manage game state, parameters, and difficulty tuning.
- Applied software engineering best practices including Git-based version control, iterative refactoring, and design patterns (Observer, FSM, Object Pool) to improve maintainability and performance.
- Optimized runtime performance through object pooling for NPCs and projectiles and tilemap-level optimizations to reduce memory allocations and frame drops.

Roguelike Game Development Jan 2025 - May 2025
Com S 327: Software Development Practices

- Developed a complete dungeon-based roguelike game using C and C++, featuring procedural dungeon generation
- Implemented Dijkstra-based pathfinding algorithms for intelligent NPC behavior, supporting tunneling and non-tunneling monsters
- Built file I/O systems enabling save/load functionality and persistent dungeon states
- Integrated ncurses-based terminal UI, fog-of-war mechanics, combat systems, and equipment management

The Cinematic Almanac Jan 2023 - May 2023
COM S 319: Software Construction and User Interfaces

- Developed a full-stack, single-page web application for exploring curated cinema content across multiple languages.
- Built a responsive frontend using React and Bootstrap, featuring dynamic movie cards, search functionality, trailer playback, and interactive UI components.
- Designed and implemented a RESTful backend using Node.js and Express, supporting authentication, role-based access, and CRUD operations for movie data.
- Integrated MongoDB for persistent storage of users, movies, and administrative data, with separate collections per language.
- Implemented admin workflows enabling authorized users to add, update, and delete movie entries through dedicated interfaces.

- Ensured seamless client-server integration through API-driven data flow and modular frontend-backend separation.

Cyclone Connect App - Best Project of the Semester Jan 2023 - May 2023
COM S 309: Software Development Practices

- Co-developed a full-featured Android application designed as a unified campus platform for Iowa State University, consolidating academics, utilities, and student services into a single app.
- Led frontend development in Android Studio, implementing core features including class scheduling, interactive campus maps, weather integration, notes, calendar, and lost-and-found modules.
- Designed and built a dynamic home screen featuring a trivia and history carousel highlighting Iowa State University facts, automatically rotating content every 7 seconds to improve user engagement.
- Implemented a daily-changing trivia system showcasing campus history and key information, enhancing first-time and recurring user experience.
- Collaborated in an Agile team environment, contributing to feature integration, UI/UX refinement, and cross-component coordination.
- Worked with CI/CD pipelines to automate builds, testing, and deployment workflows, improving development efficiency and reliability.

Operating System Process Scheduler Implementation Aug 2025 - Dec 2025

- Extended xv6 RISC-V with Round-Robin with Strict Priorities (RRSP) and Multi-Level Feedback Queue (MLFQ) schedulers
- Implemented kernel-level system calls including startLogging, stopLogging, and nice
- Designed priority demotion, time-allotment tracking, and periodic priority boost mechanisms
- Evaluated scheduler correctness using CPU-bound and I/O-bound workload testing

WORK EXPERIENCE

Desktop Support Technician May 2024 - Present
Iowa State University Veterinary Diagnostic Lab Ames, IA

- Provide day-to-day desktop and technical support for faculty and staff, ensuring reliable IT operations in a laboratory environment.
- Troubleshoot, configure, and maintain desktops, peripherals, and software; diagnose hardware and OS-level issues across Windows and Linux systems.
- Manage and resolve issues related to the Laboratory Information Management System (LIMS), ensuring system availability and functionality.
- Review, evaluate, and advise on hardware and software applications; assist users with optimal usage and best practices.
- Deliver user training and technical guidance on system interfaces, tools, and workflows to improve efficiency and reduce recurring issues.
- Conduct testing of revised or newly developed system software, collect operational data, and identify performance or compatibility issues prior to deployment.

Lab Monitor Jan 2024 - May 2024
Coover Hall - College of Engineering Ames, IA

- Oversee laboratory safety protocols and personal protective equipment (PPE) compliance; respond to safety incidents and administer first aid when required.
- Maintain, calibrate, and troubleshoot laboratory equipment while ensuring regulatory compliance and a clean, organized lab environment.

LEADERSHIP & ACTIVITIES

- **Vice President & Treasurer, Iowa State AI & ML Club** - Co-founded organization, managed finances, and led AI/ML initiatives
- **Judo Athlete** - Yellow Belt in Judo