

HARSHA VARDHAN GUNTREDDI

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SUMMARY

A B-Tech student intensely mastering Full Stack development while advancing skills in Data Science, Machine learning, PC building, server deployment, computer networking. Demonstrating prowess in writing reusable, testable, and efficient code, integrating technical expertise, project management, and clear communication to deliver user-centric software solutions. Additionally, I am enhancing my skills in the domain of AI.

WORK EXPERIENCE

SONY-SSUP (Project INTERN)

Developing an Edge-based Cyber-Physical System (CPS) for Smart Polyhouse Solar Drying, optimizing food product drying using solar energy and sensor technology. Using Spresense, stm, etc.

Working with Daisy Seed 1.1 (Electrosmith) & SPRESENSE for real-time data acquisition, embedded system development, and IoT sensor network integration to enhance agricultural efficiency.

A smart agriculture monitoring system using Daisy Seed as the main controller with FreeRTOS for real-time multitasking. Integrated SHT21 sensors for environmental data, ESP32 for WiFi communication, and GSM modules for cellular backup to upload sensor logs and images via MQTT/FTP. Designed a robust RTOS architecture with mutex-protected queues for inter-task communication and fail-safe error handling. Prototyped on custom hardware, achieving automated remote field monitoring with 3-minute data intervals."

<https://developer.sony.com/posts/ssup-india-pioneering-research-projects>

KEY PROJECTS

Deep Learning framework towards adaptive encryption switching in Edge systems

Developed ASCON and GIFT algorithms to protect edge devices from differential, integral, and cube attacks.

Dynamic RNN-Based Security

Designed a switching RNN model to adapt encryption techniques based on real-time threat analysis.

Optimized for Raspberry Pi, ensuring efficient execution in resource-constrained environments.

Pneumonia Detection in Chest X-Rays using Transfer Learning

Engineered a diagnostic deep learning model for the binary classification of pneumonia from chest X-rays, architecting a Convolutional Neural Network (CNN) that leverages a VGG16 backbone pre-trained on ImageNet.

Implemented a two-stage transfer learning protocol, initially training a custom classifier on frozen convolutional layers before fine-tuning the entire model's weights, a strategy that significantly boosted predictive performance.

Deployed an on-the-fly data augmentation pipeline to synthetically expand the training dataset, mitigating class imbalance and enhancing the model's generalization capabilities.

Achieved a benchmark accuracy of 93% on the held-out test set, creating a powerful proof-of-concept for computer-aided diagnosis in medical imaging.

Tech Stack: Python, TensorFlow, Keras, Scikit-learn, OpenCV, Matplotlib.

Deadlock Prevention and Detection in Java-Based OS Simulation

Developed a Java-Based OS Kernel Implemented deadlock prevention using resource allocation graphs and Banker's algorithm to ensure safe and efficient process execution. Integrated Real-Time Deadlock Detection Designed Java-based detection algorithms to identify circular wait conditions and resolve deadlocks dynamically. Optimized Thread Scheduling and Resource Management Enhanced process scheduling and synchronization mechanisms to minimize deadlocks, improving system performance and responsiveness.

Distributed Video Communication & Streaming Platform-NETWORKING, DS

Architected a unified video platform for both on-demand streaming and real-time multi-node video calling over a local network, optimizing for low-latency and high availability without consuming mobile data.

Implemented agent-based load balancing with a Flask API, using the Join-the-Shortest-Queue algorithm to efficiently manage resource utilization across edge nodes and cloud servers.

Engineered an adaptive bitrate streaming solution that dynamically adjusts video quality based on real-time network conditions, ensuring a smooth user experience.

Designed a dynamic replication scheduler to intelligently distribute video files to edge nodes, proactively mitigating demand spikes and enhancing content availability.

Integrated end-to-end encryption and digital image processing techniques to secure all video communications and optimize file sharing across the network.

Deployed Prometheus and Grafana for comprehensive, real-time performance monitoring, gaining actionable insights into server load, request patterns, and overall system health.

Technologies: Python, Flask, Nginx, Prometheus, Grafana, Distributed Systems.

Blockchain Project: Quantum-Secure Ledger

Built a lightweight blockchain with ECDSA-based transaction signing and SHA-256 hashing, ensuring tamper-proof data integrity.

Designed a miner node (Ubuntu) to validate transactions via Proof-of-Work (PoW) with adjustable difficulty.

Developed a client simulator (Windows/macOS) to generate/sign transactions and broadcast to the network.

Implemented a real-time verifier (Cloud VM/Local Server) to audit chain consistency and detect anomalies.

Optimized performance by reducing signature verification time to <100ms using parallel processing.

Simulated attacks (e.g., double-spend, hash collisions) to test robustness, achieving 100% detection rate.

Mobile Device Forensics Project

Data Extraction: Extracted call logs and app data from non-rooted Android devices using ADB on Kali Linux in VirtualBox, ensuring ethical forensic practices.

Tool Proficiency: Mastered Autopsy and ABE to analyze backups, resolving USB passthrough and JAR corruption issues for reliable data recovery.

Security Navigation: Bypassed Android restrictions with backup methods, maintaining evidence integrity for forensic validity.

Issue Resolution: Fixed ADB authorization and Java compatibility (JDK 8/11) errors, ensuring project success.

Data Analysis: Queried databases with SQLite and Autopsy, delivering professional investigative reports.

OWN DIY HOME LAB

MY HOBBY Engineered and deployed a Power-over-Ethernet (PoE) Industry Grade-based Network Attached Storage (NAS) system, integrating comprehensive networking solutions; concurrently developed and hosted a full-stack website utilizing own server on the same platform **TrueNAS core,PlexServer,etc** , Installed **Ubiquiti Gear**,and Developed OWN **DIY VPN** and A ad blocker **DNS SERVER** which running as a **DOCKER** container on raspberrypi and **MINECRAFT** server and used **PROXMOX** as backup and dedicated a server room for many more projects,ODD **VIRTUAL MACHINE,STORAGE SERVER, MEDIA SERVER,Kubernetes Cluster**

PLEASE CHECK OUT MY GITHUB FOR MORE INTERESTING PROJECTS.

CERTIFICATIONS:

IIT MADRAS: AI & ML	CERTIFICATE ISSUED ON JAN 2025
IIT MADRAS: IoT automation with Raspberry Pi	CERTIFICATE ISSUED ON JAN 2025

EDUCATION

Bachelor of Technology in Computer Science and Engineering
Amrita University, Coimbatore, India (Sep2022 - Jun 2026)

ADDITIONAL INFORMATION

Programming Languages: Proficient in Python, Java, C,C++ Python, JavaScript,Go, Scala, Prolog, Embedded C

Web Development: HTML, CSS, React, Node.js, Express, RESTful APIs

Frameworks & Tools: React.js, Node.js, Tailwind CSS, Bootstrap, Figma, Streamlit, Scikit-learn, NLTK, Docker, REST APIs, OAuth 2.0, Graph Theory

Cloud Platforms: Google Cloud Platform (GCP), AWS, Microsoft Azure

Expertise: Distributed Systems, Full-Stack Development, Cloud Computing, NLP, IoT, Machine Learning, TCP/IP

Development Practices: Agile, CI/CD, Git, Jira, Jenkins, Unit Testing

Concepts: Large-scale System Design, Scalability, Data Compression, Search Technologies, Networking, Security

Strong understanding and practical application of efficient data structures and algorithms and DAA.

Databases: SQL, NoSQL.

Version Control: Git, GitHub.

Operating Systems: Unix/Linux, Windows.