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."

⬤ Only Private REPO refer this for public details 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
Deployed on Raspberry Pi with Ubuntu Server, ensuring efficient execution in resource-constrained environments.

⬤   **Skills:**Raspberyy pi

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**

⬤   **Skills:**

Optimized Peer-to-Peer Video Calling Application - NETWORKING

Designed and implemented a video calling application enabling multiple nodes to connect over the same network without using mobile data. Network Load Optimization Engineered an efficient data transmission model to minimize network load while maximizing the number of concurrent connections. Secure Communication and File Sharing Integrated end-to-end encryption and digital image processing techniques for secure video calls and optimized file sharing across the network.

⬤   **Skills:**

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.

⬤   **Skills:**

Industrial Smart Inventory Control System

- Designed an automated inventory tracking system using industrial single-board computers
- Developed high-speed pattern recognition (Shift-Or algorithm) for barcode/RFID detection
- Created optimized delivery routing using bipartite graph matching (Hopcroft-Karp)
- Implemented real-time networked communication between warehouse subsystems

⬤   **Skills:**

KEY PROJECTS

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.

Skills:

Distributed Video Streaming System

Architected a distributed video streaming platform using edge nodes and cloud-based servers, optimizing content delivery across a local network.
Implemented agent-based load balancing with a Flask API, leveraging the Join-the-Shortest-Queue algorithm to ensure efficient resource utilization.
Engineered adaptive bitrate streaming, dynamically adjusting video quality based on real-time network conditions to enhance user experience.
Designed a dynamic replication scheduler, automating video file distribution to edge nodes to mitigate demand spikes and improve availability.
Integrated Prometheus and Grafana for real-time performance monitoring, providing actionable insights into server load and request patterns.
Demonstrated proficiency in Python, Nginx, and distributed systems, delivering a scalable solution with robust fault tolerance.

Skills:

E-Learning Platform

Architected a comprehensive learning management system akin to an advanced educational platform, integrating seamless functionality for students, faculty, and administrators to enhance academic collaboration and efficiency.
Engineered a robust, scalable backend using modern cloud infrastructure, over a network to ensure high availability and performance for diverse user interactions.
Developed intuitive user interfaces with responsive design, enabling streamlined access to course materials, schedules, and administrative tools across devices.
Implemented secure data management protocols to safeguard sensitive academic records, ensuring compliance with privacy standards.
Facilitated real-time communication and feedback mechanisms, fostering an interactive learning environment for all stakeholders.

Skills:

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.

Skills:

ADDITIONAL INFORMATION

Programming Languages: Proficient in Python, JavaScript, C,C++
Web Development: HTML, CSS, React, Node.js, Express, RESTful APIs Strong understanding and practical application of efficient data structures and algorithms.
Databases: SQL, NoSQL
Version Control: Git, GitHub.
Operating Systems: Unix/Linux, Windows.
IIT Madras - Raspberrypi,AI ,ML

EDUCATION DETAILS:

2022 - 2026 (B.TECH CSE) :

Amrita Vishwa Vidyapeetham
Coimbatore,TN

2022(CBSE(XII)):
Narayana Group of schools
Vizag AP   **CBSE**

2020(CBSE(X)):
Narayana Group of schools
Vizag AP   **CBSE**