ADITYA SAIRAM PULLABHATLA
Software Engineer

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Professional Summary

Software Engineer with 4+ years developing **performance-critical applications** in **C/C++** with expertise in **low-level systems programming**, **multi-threaded architectures**, and **communication protocol implementation**. Demonstrated ability to **optimize system performance** by 40% in **resource-constrained environments**, architect **concurrent applications** using **process management** and **synchronization primitives**, and implement **reliable data transfer protocols** with **integrity verification** across distributed nodes. Proficient in **UNIX/Linux systems programming**, **TCP/UDP socket communication**, **algorithm implementation in C**, and **debugging complex software-hardware interactions**. Proven track record delivering **production solutions** for **high-reliability systems** requiring **deterministic performance** and **data accuracy**.

Technical Skills

- **Programming Languages:** C, C++, Java, Python, SQL, Bash scripting
- **Systems Programming & Embedded:** UNIX/Linux system programming, multi-threading, process management (fork/exec), inter-process communication (IPC), memory management, socket programming, signal handling, real-time constraints, bit manipulation
- **Communication Protocols & Networking:** TCP/UDP protocols, socket-based communication, RPC mechanisms, reliable broadcast protocols, serial communication fundamentals, data serialization (JSON/XML)
- **Development Tools & Version Control:** Git, GitHub, GCC/G++ compiler toolchain, Make/CMake, GDB debugger, Valgrind, Linux command line, code profiling tools
- **Hardware & Electronics:** Digital logic fundamentals, schematic reading, hardware-software integration, embedded systems architecture, low-level debugging, register-level programming concepts
- **Security & Data Integrity:** AES/RSA encryption algorithms, MD5/SHA checksums, data validation, secure coding practices, integrity verification protocols
- **Databases & Performance:** SQLite, MySQL | Query optimization, indexing, embedded database integration
- **Software Engineering:** Algorithm design, concurrent programming, performance optimization, memory profiling, debugging, code review, technical documentation

Work Experience

Software Engineer | Robotics Technologies LLC   *Mar 2025 – Present*
Duncanville, TX

- Architected distributed job scheduling system using **C-based RPC mechanisms** and **fork/exec process management**, enabling automatic workload migration across 5+ servers when CPU load exceeded configurable thresholds
- Engineered **multi-threaded server application** handling concurrent client connections using **socket programming** and **TCP/IP protocols**, implementing thread-safe data structures and synchronization primitives for reliable inter-process communication
- Optimized **embedded SQLite database** performance reducing transaction retrieval time by 40% through strategic indexing and query optimization across 50,000+ records in resource-constrained production environment
- Implemented **UDP-based distributed data replication system** with **MD5 checksum verification** and reliable broadcast protocol ensuring atomic updates and data integrity across multiple server nodes
- Developed **UNIX shell in C** with job control, signal handling, and pipe redirection, demonstrating deep understanding of process lifecycle management and low-level systems programming
- Built Android mobile application using **Java** with **SQLite embedded database** implementation, demonstrating experience with resource-constrained mobile environments and efficient data management

Graduate Research Assistant | Cleveland State University - *Cleveland, OH*   *Aug 2023 – Dec 2024*

- Architected **distributed mutual exclusion system** implementing Ricart-Agrawala algorithm **in C** with **UDP socket communication**, enabling conflict-free resource access across distributed nodes through timestamp-based request ordering
- Designed **multi-threaded MapReduce framework in Java** processing multi-gigabyte datasets with parallel map/reduce workers, demonstrating understanding of **concurrent programming** and distributed data processing architectures
- Implemented **AES and RSA encryption/decryption algorithms in C** for secure file transfer system, including key generation, cipher block chaining modes, and **cryptographic protocol implementation**
- Developed **Python-based data processing pipelines** with automated validation and database integration, processing 1M+ records with optimized indexing strategies for high-performance data retrieval
- Engineered search engine with **TF-IDF ranking algorithm** and inverted indexing supporting sub-second query response times across 100,000+ documents using **Python** and algorithmic optimization
- Conducted **penetration testing and security assessments** on software systems, identifying OWASP Top 10 vulnerabilities

including SQL injection, XSS, and authentication bypass exploits
- Assisted in teaching computer science courses including **Data Structures, Algorithms**, and Database Systems, supporting 100+ students with lab instruction and technical mentoring

Software Engineer / Data Catalog Engineer | Amazon, *Chennai, India*   *Jun 2021 – Dec 2022*

- Automated large-scale data processing for 10,000+ SKUs using **Python scripting** and **API integration**, reducing manual operations by 80% and decreasing processing time by 50% through systematic automation workflows
- Engineered **ETL data pipelines** processing large-scale datasets with automated validation, transformation, and quality assurance workflows maintaining **99% data accuracy** across operations
- Developed **SQL-based data quality audits** and automated error correction processes, implementing systematic validation rules and **integrity checks** ensuring reliable data across multi-system operations
- Built **Python-based data extraction and processing tools** implementing parsing logic, data normalization, and automated validation pipelines for structured data management
- Optimized **database queries** and implemented **indexing strategies** improving data retrieval performance for high-volume system supporting thousands of concurrent transactions
- Coordinated with cross-functional teams including vendors and technical stakeholders to define data requirements, **troubleshoot integration issues**, and implement scalable data solutions

Software Engineer | Pyramid SoftSol - *Hyderabad, India*   *May 2020 – May 2021*

- Developed software applications using **C and Java** for client projects, implementing core functionality, **debugging production issues**, and optimizing code performance across multiple software modules
- Collaborated with engineering teams to design, develop, and test software components, participating in **code reviews** and contributing to technical documentation and system architecture discussions
- Implemented database solutions using **MySQL** with **query optimization** and schema design, supporting data-intensive applications with efficient data access patterns and **indexing strategies**
- Troubleshot and resolved software defects through **systematic debugging**, **root cause analysis**, and implementation of corrective solutions, improving application **stability and reliability**

Education

- **Master's in Computer Science** | Cleveland State University, OH
   Relevant Coursework: Advanced Database Systems, Cloud Computing, Data Management, Database Optimization, Software Engineering, Algorithms, Distributed Systems, Computer Architecture, Cryptography & Network Security
- **Bachelor's in Computer Science** | Jawaharlal Nehru Technological University Hyderabad, India
   Relevant Coursework: Data Structures and Algorithms, Network-Based Application Development, Cloud Computing, Database Management Systems, Operating Systems, Computer Architecture, Information Security

Certifications & Achievements

- **AWS Certified Cloud Practitioner (CLF-C02)** - Scalable cloud architecture, distributed systems, and cloud security
- **Microsoft Certified: Azure Developer Associate** - Cloud-native application development, CI/CD pipelines, and secure DevOps practices
- **Google Cloud Professional Database Engineer** - Enterprise analytics, distributed data optimization, and encryption at rest/in transit
- **Oracle Certified Professional: SQL & PL/SQL Developer** - Advanced database design, query optimization, and secure data management
- **Full Stack Java Developer Certification** - REST APIs, backend services, object-oriented programming, and application security
- **Advanced System Integration Certification** - API development, secure coding practices, and cryptographic protocol implementation