Nithish Suresh Babu

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Summary

Results-driven cloud-native software engineer with expertise in building distributed systems using **Go** and **Python**. Proficient in developing high-performance, fault-tolerant applications leveraging **AWS/GCP** cloud services, **microservices architecture**, and **containerization**. Research experience in GenAI with a focus on deepfake detection systems. Passionate about designing scalable solutions that handle high-concurrency workloads while maintaining sub-100ms response times.

Experience

University of Michigan - Deep Fake Research Lab *Sep 2024 – Present*

Research Assistant - GenAI

- **AI Detection System Development:** Leveraged GenImage dataset to train AI detection system, achieving a **98.5%** accuracy rate in deepfake image identification, positioning system as benchmark for future academic research.
- **State-of-the-Art Performance:** Achieved a detection accuracy of **98.5%** in identifying deepfake images, significantly outperforming existing methods by **3.7%** on benchmark tests.
- **Advanced Generator Analysis:** Tested against leading AI/ML models including Midjourney, Stable Diffusion, ADM, GLIDE, Wukong, VQDM, and Big, demonstrating superior detection capabilities across diverse image classes.

Personal Project - Real-Time Communication Systems *Jan 2024 – Apr 2024*

Software Engineer - Chat Application

- **Scalable System Design:** Engineered a Discord-inspired chat platform capable of supporting **2500 concurrent clients** across **8 backend servers** with message delivery of **<100ms** average latency, utilizing **Go**, **WebSockets**, and connection pooling for optimal resource management.
- **Database Architecture:** Implemented persistent chat storage using **DynamoDB** with Global Secondary Indexes achieving **10ms** read/write latency and designed a **consistent hashing router** enabling seamless horizontal scaling with minimal disruption during service degradation.
- **DevOps Excellence:** Integrated **AWS SQS FIFO queues** for guaranteed in-order message broadcasting while containerizing the application with **Docker**, reducing deployment time by **40%** through CI/CD pipeline optimization with comprehensive monitoring.
- **Key Learnings:** Gained expertise in distributed system design patterns, high-availability architectures, WebSocket communication protocols, and AWS service integration for real-time applications.

Personal Project - AI-Driven Analytics *Feb 2024 – May 2024*

Software Engineer - Tweets Sentiment Analysis

- **GenAI Implementation:** Developed an analytics platform capable of processing **10,000+** tweets/hour with **92%** sentiment classification accuracy using a fine-tuned **Llama-2** model and optimized prompt engineering techniques via **LangChain**.
- **Full-Stack Development:** Created a responsive interactive dashboard with customizable time-range and hashtag filters, visualizing sentiment distribution, trending keywords, and temporal patterns with real-time updates.
- **Performance Optimization:** Achieved **35%** reduction in per-tweet latency through **LangChain** pipeline optimization and maintained **96.9%** uptime during high-traffic periods using containerized **Docker** deployment with auto-scaling.
- **Key Learnings:** Mastered large language model integration, prompt engineering techniques, real-time data processing pipelines, and data visualization strategies for actionable insights.

Personal Project - Security Systems *Mar 2024 – Jun 2024*

Software Engineer - Smart Door Authentication

- **Biometric Authentication:** Engineered a distributed smart door system with secure face authentication using **AWS Kinesis Video Streams** and **Rekognition**, achieving **98%** recognition accuracy with **<2s** response time.
- **Security Implementation:** Developed a time-limited SMS-based **OTP system** with **99.99%** delivery rate via **AWS SNS** for authorized visitor verification and comprehensive visitor management with detailed access logs.
- **Serverless Architecture:** Built a visitor registration portal handling **500+** registrations with **DynamoDB** CRUD operations, achieving **99.95%** API availability through **Lambda auto-scaling** for peak demand periods.
- **Key Learnings:** Acquired expertise in AWS computer vision services, serverless architectures, multi-factor authentication systems, and secure API design principles.

Education

University of Michigan *August 2023 – May 2025*

Master of Science in Computer and Information Science *GPA: 3.8*

Anna University *August 2018 – May 2022*

Bachelor of Technology in Computer Science and Engineering *GPA: 3.4*

Skills & Interests

Languages & Database: Golang, Python, C/C++, JavaScript, TypeScript, PostgreSQL, MySQL, DynamoDB, SQLite3, Redis

Cloud Services & Infrastructure: AWS, Google Cloud, Docker, Kubernetes

DevOps & CI/CD: Git, GitHub Workflows, Microservices Architecture, Serverless Computing

AI / ML: Ollama, LangChain, OpenAI, PyTorch, OpenCV, AWS Rekognition