

# Nithish Suresh Babu

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## SUMMARY

Cloud architecture enthusiast with expertise in distributed systems and serverless application development. Experienced in building high-throughput cloud applications, including real-time communication systems (2500+ concurrent users), serverless processing pipelines (99.8% availability), and cost-optimized cloud-native authentication systems.

## EDUCATION

University of Michigan

August 2023 – May 2025

*Master of Science in Computer and Information Science*

Anna University

August 2018 – May 2022

*Bachelor of Technology in Computer Science and Engineering*

## SKILLS & INTERESTS

**Cloud Services & Infrastructure:** AWS (EC2, S3, Lambda, API Gateway, DynamoDB, SQS, SNS, App Runner, Route 53, IAM, ELB, Kinesis, Rekognition, Polly), Google Cloud (Cloud Run, Bigtable, Pub/Sub), Docker, Kubernetes

**Languages & Database:** Golang, Python, Modern C++, JavaScript, TypeScript, PostgreSQL, MySQL, DynamoDB, SQLite3

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

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

## EXPERIENCE

*Research Assistant - Deep Fake (GenAI)*

Sep 2024 – Present

- **AI Detection System Development:** Worked extensively with the GenImage dataset, processing over **1,200,000** real/fake image pairs across **1,000** classes mirroring ImageNet.
- **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.
- **Cloud-Based Processing Pipeline:** Designed and deployed **scalable cloud infrastructure** in AWS to process and analyze **5TB+** of image data, leveraging containerized environments for parallel processing to reduce training time by **65%**.

## PROJECTS

**Real-Time Chat Application** | <https://github.com/nithish-95/chat-webapp>

Personal Project, 2024

- **Technologies Used:** Go, WebSockets, HTML5, Tailwind CSS, Docker, AWS (DynamoDB, SQS, App Runner, Route 53, ACM)
- Designed and deployed a cloud-native chat application with **multi-region failover architecture** on AWS, achieving **99.95%** service availability and scalability to **2500** concurrent users across **8 backend servers**.
- Implemented **consistent hashing based routing service** for WebSocket connection distribution with DynamoDB persistent storage (**10ms** read/write latency), ensuring data consistency across availability zones.
- Leveraged AWS SQS FIFO queues for reliable event-driven inter-server communication and containerized the system with Docker, reducing deployment times by **40%** through CI/CD pipeline automation.

**Serverless Text-To-Speech Application** | <https://github.com/nithish-95/AudioBook>

Personal Project, 2024

- **Technologies Used:** AWS (Polly, Lambda, API Gateway, DynamoDB, SNS, S3), React, HTML5, Tailwind CSS
- Architected a fully serverless event-driven application on AWS using **6** distinct cloud services integrated through a microservices approach, demonstrating advanced cloud design patterns with a responsive ReactJS frontend achieving **<1.2s** initial load time.
- Implemented asynchronous processing pipeline with AWS Lambda and SNS for text-to-speech conversion, processing documents up to **10,000** words with **<3s** average conversion time and **99.9%** completion rate.
- Leveraged AWS Lambda's pay-per-use model with optimized execution contexts, reducing operational costs by **40%** compared to server-based solutions while maintaining **<150ms** average API response time and **99.8%** availability.

**Cloud-Based Security Authentication System** | <https://github.com/nithish-95/SmartDoorAuthentication>

Personal Project, 2024

- **Technologies Used:** Python, AWS (Kinesis Video Streams, Rekognition, Lambda, DynamoDB, S3, SNS)
- Engineered a cloud-native biometric authentication system leveraging AWS Rekognition and Kinesis Video Streams for real-time face recognition with **98%** accuracy and **<2s** response time.
- Designed a serverless authentication pipeline with multi-factor authentication including SMS-based **4-digit** OTP system (AWS SNS) and secure visitor registry in DynamoDB with record-level encryption.
- Implemented auto-scaling microservices architecture for visitor management handling **500+** concurrent authentications with **99.95%** API availability using Lambda functions distributed across multiple availability zones.

**Cloud-Based Social Media Sentiment Analysis** | <https://github.com/nithish-95/TwitterAnalysis>

Final Year Project, 2022

- **Technology Used:** Python, HTML5, Tailwind CSS, JS, LangChain, Llama, Cloud Deployment
- Developed a scalable cloud-based sentiment analysis platform processing real-time social media data through a distributed streaming architecture with on-demand resource allocation.
- Implemented an AI-powered sentiment analyzer processing **10,000+** tweets/hour with **92%** accuracy using Llama-2 LLM, deployed as containerized microservices for horizontal scaling.
- Optimized LangChain processing pipeline by reducing per-tweet latency by **35%** through prompt engineering and cloud-native optimizations, achieving **96.9%** uptime during peak load with **12k+** analyzed tweets.