Michael **Mahan**

FIRMWARE ENGINEER · SOFTWARE ARCHITECT

Houston, Texas

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"Move Fast and Break Things"

Summary

I am an innovative and results-driven technology professional with a comprehensive background in firmware engineering, data engineering, and fullstack dev, complemented by a strong academic foundation in computer science. With over 5 years of experience, my career has spanned diverse roles where I have excelled in developing and implementing cost-effective solutions, optimizing system performance, and leading projects to successful completion.

At Starling Medical, I played a pivotal role as the sole developer of an IoT medical device's firmware, driving the project from prototype to production and significantly enhancing device reliability and operational efficiency. My tenure at SLB and the Louisiana Tech Research Institute (LTRI) honed my skills in data management, infrastructure engineering, and project leadership, further demonstrating my capability to deliver high-quality services and innovative solutions.

My technical proficiency spans a wide range of tools and technologies, including C, Python, Node.js, and various communication protocols, underpinned by a strong commitment to best practices in software development and project management methodologies such as Agile, Scrum, and Kanban.

Skills

DevOps	AWS, Docker, Linux, Actian DataConnect, Apache Spark, Dataiku, Serverless
Web	Jekyll, Redux, React, HTML5, CSS, REST API, requests, MQTT, MySQL, MongoDB, DynamoDB
Embedded	Zephyr RTOS, Embedded C, Driver development, Bluetooth Low Energy, LTE, IoT, UART, I2C, SPI, USB
General Programming	Python, C, BASH, C++, Node.js, LaTeX, Kotlin
Interpersonal	Team player, leadership, negotiation, mediation

Education

LaTech(Louisiana Tech University)   *Ruston, Louisiana*

M.S. IN COMPUTER SCIENCE   *Aug. 2020 - May. 2022*

- Thesis on testing attack surface of Oculus Quest 2

LaTech(Louisiana Tech University)   *Ruston, Louisiana*

B.S. IN COMPUTER SCIENCE   *Aug. 2014 - Mar. 2020*

- Recieved Presidential Scholarship for >32 ACT + HS GPA

Projects

Local-compute-only AI voice asssitant   *GitHub*

ECHO   *Feb. 2024 - Current*

- Running an AI stack using only local compute.
- I can talk to my computer as-is, with no network traffic, and it talks back via high fidelity voice synthesis, and the sum of human knowledge.
- Current goals include adding RAG for induction of personal notes into AI knowledge base.

Using Node.js to implement a Multi-User Dungeon on Discord   *GitHub*

MOD   *Nov. 2019 - May 2020*

- A handmade MUD engine that interfaces with Discord via the JavaScript chatbot API, Discord.js.
- Uses Serverless DynamoDB as a backend.
- Highly modular, allows for live editing of items, rooms, entities, etc.

Webscraping tweets for archival   *GitHub*

ARXVER   *Jan. 2024*

- Twitter archival tool for converting tweets into Markdown
- Pages automatically tagged such that a PKM, such as Obsidian, can ingest and use them immediately.
- Synthesis of Python web scraping, JSON parsing, Markdown templating, and HTML arrangement.

Art generation tool using Geocities banner archive

GitHub

88X31 COLLAGER

Mar. 2024 - Apr. 2024

- Generating banner-per-pixel replacement videos.
- Done in Python with supporting libraries like Pillow and ImageMagic.
- Utilizes Python's multiprocessing module including shared_memory.

Work Experience

Starling Medical

Houston, Texas

FIRMWARE ENGINEER

Nov. 2022 - Dec. 2023

- Collaborated with a 9-person, Y Combinator-backed team to align app-device integration and UX.
- Sole developer for a IoT medical device's firmware, prototype to production, using Zephyr RTOS.
- Optimized power management for NRF9160 and NRF52840, achieving target 6+ months of operation time.
- Contributed to inventory and failure analysis for pilot devices, reduced LTE cellular signal failures by 48%.
- Engineered Bluetooth Low Energy (BLE) services for communication with phone apps.
- Devised and executed a solution to AWS IoT-core cert signing, saving 5,000+ USD yearly operations costs.
- Leveraged sensor datasheet to extend Zephyr driver, increasing usable features from 60% to 100%.
- Coordinated communication between on-board components via UART/I2C/SPI/USB.
- Shipped multiple packages to factory in China, valued in excess of 8,000 USD.
- Acted as liason for Chinese manufacturer via WeChat and email.

SLB (formerly Schlumberger)

Houston, Texas

DATA & INFRASTRUCTURE ENGINEER

Jun. 2022 - Nov. 2022

- Delivered excellent service to international clients to ensure 100% customer satisfaction with company's data management software.
- Orchestrated calls via Teams to connect clients with expert team members, exceeding target satisfaction of 75% quarterly.
- Employed Dataiku to create endpoints for ETL and machine learning (ML) model queries, leading to 2% boost in efficiency of existing data processes.

Business Alliance Financial Services (BAFS)

Ruston, Louisiana

SOFTWARE ENGINEER

Nov. 2017 - Mar. 2020

- Aided initial development of a business loan-servicing application, now serving 250+ clients nationally.
- Assembled error-checking/alert service in Python to ensure nightly database updates run smoothly.
- Expanded and refined filtering/ETL functionality to Python API, increasing capabilities of service by 5%.
- Constructed web views using JavaScript & React, contributing to 10% of production frontend code.

United States Air Force / Louisiana Tech Research Institute (LTRI)

Ruston, Louisiana

GRADUATE FELLOW

Jun. 2020 - May. 2021

- Co-lead team to develop a multi-module system for digital twinning of simulations and real events in a 5-minute window.
- Established foundational project management protocols for team, increasing productivity 60%.
- Deployed onboarding curriculum via lectures and workshops to build programming skills & best practices for 4 undergraduate team members.
- Lead efforts to understand existing C++ source code.
- Formulated a program for generation and use of geolocation data based on VOACAP radio data with Python/MongoDB, improving simulation accuracy by 20%.

Fenway Group

Ruston, Louisiana

ASSOCIATE CONSULTANT

Apr. 2017 - Nov. 2017

- Contracted out to a large healthcare company with 120,000+ member userbase.
- Constructed dashboards and pivot tables in Splunk for error reporting heuristics, reducing downtime and increasing corrections rate.
- Leveraged Actian DataConnect ad SQL queries for ETL.

Academic Experience

Louisiana Tech University

Ruston, Louisiana

RESEARCH ASSOCIATE

Jun. 2021 - Aug. 2021

- Joined a small team making a modular netowork traffic filtering software for Linux(Ubuntu server).
- Created logging and alert services using MQTT, MySQL, libcurl, curl, C++, Twilio SMS, and SendGrid

Louisiana Tech University

Ruston, Louisiana

GRADUATE STUDENT

Aug. 2020 - May. 2022

- Designed and Tested Android malware against Oculus Quest 2
- Executed SRS testing malware sample using Android Studio/Gradle/Kotlin.
- Proved viability of ransomware on VR headset.

Extracurricular Activity

KLPI - LaTech's rock alternative station   *Ruston, Louisiana*

Sep. 2015 - May. 2018

- Responsible for maintaining KLPI's web presence.
- Redesigned entire KLPI site. Current site design is the one I left the group with.