

Michael Mahan

FIRMWARE ENGINEER · COMPUTER APPRECIATOR

Houston, Texas

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“I have no special talent. I am only passionately curious.”

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, Multiprocessing, Linux, Actian DataConnect, Dataiku, Serverless, MQTT
Web	Jekyll, Redux, React, HTML5, JSON, CSS, REST API, Requests, MySQL, MongoDB, DynamoDB
Embedded	Zephyr RTOS, Embedded C, Driver Development, Bluetooth Low Energy, LTE, IoT, UART, I2C, SPI
General Programming	Python, C, BASH, C++, Node.js, LaTeX, Kotlin, sed, Regex
Interpersonal	Team Player, Technical Communication, Leadership, Customer Service, Requirements Gathering

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
• Received Presidential Scholarship for >32 ACT + HS GPA	

Projects

Local-compute-only AI voice assistant	GitHub
ECHO PROJECT LEAD	Feb. 2024 - Current
• Orchestrating the implementation of an AI stack reliant solely on local computational resources, enhancing privacy and response times.	
• Spearheading a diverse team through the complexities of system architecture and software development, fostering innovation and teamwork.	
• Innovating a conversational interface allowing secure, offline voice interactions, leveraging voice synthesis to simulate real-time discourse.	
Using Node.js to implement a Multi-User Dungeon on Discord	GitHub
MoD LEAD ON CAPSTONE GROUP PROJECT	Nov. 2019 - May 2020
• Secured project approval and led a six-member team in developing a bespoke MUD engine that integrates with Discord, enhancing user engagement.	
• Engineered a highly scalable, serverless backend using DynamoDB, achieving robust performance and reliability.	
• Instituted a modular design allowing for dynamic content updates, significantly enhancing game flexibility and player creativity.	
Webscraping tweets for archival	GitHub
ARXVER PERSONAL PROJECT	Jan. 2024
• Developed a sophisticated tool for archiving Twitter content into Markdown, facilitating easy integration with personal knowledge management systems like Obsidian.	
• Automated content tagging and organization using advanced web scraping and parsing techniques, streamlining data retrieval and utilization.	
• Synthesis of Python web scraping, JSON parsing, Markdown templating, and HTML arrangement.	

Art generation tool using Geocities banner archive

GitHub

88X31 COLLAGER | PERSONAL PROJECT

Mar. 2024 - Apr. 2024

- Created a unique video generation tool that transforms pixels into banner art, employing Python and libraries such as Pillow and ImageMagick for artistic content creation.
- Leveraged multiprocessing and shared memory techniques in Python, optimizing performance and resource utilization.

Modular packet filtering system

Louisiana Tech University

NETWORK FILTERING SOFTWARE | TEAM MEMBER

Jun. 2021 - Aug. 2021

- Contributed to the development of an innovative network traffic filtering solution for Linux servers, enhancing network security and performance.
- Designed and implemented comprehensive logging and alert systems, incorporating a variety of technologies (MQTT, MySQL, C++) to ensure real-time monitoring and response.

Study and generation of ransomware samples

GitHub

SIMPLE RANSOMWARE SAMPLE | THESIS WORK

Aug. 2020 - May. 2022

- Conducted groundbreaking research on the feasibility of ransomware attacks on VR headsets, specifically Oculus Quest 2, demonstrating significant vulnerabilities.
- Employed Android Studio and Kotlin to simulate ransomware attacks, contributing valuable insights into VR security challenges.

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 Nordic's NRF9160/NRF52840 and Zephyr RTOS.
- Optimized power management, 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.
- Formulated and executed a cost-saving strategy for AWS IoT-core certificate management, preserving over \$5,000 annually.
- Leveraged sensor datasheet to extend Zephyr driver, increasing usable features from 60% to 100%.
- Coordinated communication between on-board components via UART/I2C/SPI.

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 Action DataConnect and SQL queries for ETL, increasing compliance with new data standards.

KLPI - LaTech's rock alternative station

Ruston, Louisiana

WEB MASTER

Sep. 2015 - May. 2018

- Oversaw the maintenance and enhancement of KLPI's web presence, ensuring a user-friendly experience.
- Redesigned the KLPI website, leaving a lasting impact on the organization's online engagement.