Abdulquadri Abiru

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EDUCATION

University of Florida *Gainesville, FL*

- Master of Science (M.S.), Electrical Engineering (GPA: 3.7/4.0) *December 2024*
- Bachelor of Science (B.S.), Electrical Engineering (GPA: 3.6/4.0) *May 2022*

Relevant Coursework: Cloud Computing Systems Management , Cloud Computer Systems and Applications, Computer Communications, Advanced Systems Programming, IoT Security and Privacy, Wireless and Mobile Networks, Computer Programming Using Java, Programming for ECE 1 & 2, Microprocessor Applications

SKILLS

Programming: Python, C/C++, Shell, JSON, YAML, MATLAB, Java
Platforms: Windows, macOS, Linux (Ubuntu, Raspberry Pi OS)
Hardware: Raspberry Pi, STM32, MSP430, ESP32/8266, Zigbee RF Radios, Arduino
Software/Protocols: MiniNet, Docker, Kubernetes, Grafana, REST, I2C, SPI, UART, CAN
Certifications: AWS Certified Cloud Practitioner (CCP)

WORK EXPERIENCE

UF Wireless and Mobile Systems Lab *Gainesville, FL*
Graduate Research Assistant, IoT Acres Project January 2023 – *Present*

- Led the development and implementation of an IoT system for sensor data transmission on a construction site
- Achieved a 75% reduction in device overhead and costs via development of a multi-protocol, multi-threaded Python gateway on Raspberry Pi
- Automated gateway initialization using shell scripting for streamlined and efficient system startup
- Conducting rigorous testing and optimizing network infrastructure for enhanced data reliability and minimized latency
- Facilitated remote sensor deployment by designing and routing custom printed circuit boards for ESP32-based MCUs.
- Enhanced data accessibility and decision-making through AWS IoT Core, AWS TimeStream, and AWS Grafana for streamlined real-time data streaming, storage, and real-time visualization on the backend; automated backend configuration using AWS CloudFormation

Ethicon Endo-Surgery *Cincinnati, OH*
Research and Development Co-op September 2022 – *December 2022*

- Collaborated on a cross-functional team to devise and execute a test fixture for medical device component tracking
- Engineered STMF32 firmware using CubeMX and IAR to enable SPI protocol communication with a magnetometer sensor
- Developed C code to stream microcontroller data to a PC using UART protocol, managing data reception and storage with a Python script
- Conducted experiments, delivering comprehensive findings on sensor accuracy and consistency
- Supported external teams by developing a multi-threaded Python program for real-time data visualization from medical devices
- Proficiently operated standard electrical equipment and conducted hardware debugging

F5 Networks *Seattle, WA*
Software Engineering Intern June 2022 – *September 2022*

- Orchestrated Docker-based data pipeline for a Digital Twin initiative, enabling seamless sensor data transmission via OpenTelemetry protocol
- Automated the configuration of the OpenTelemetry gateway, Prometheus database, Kafka service, and Grafana within the Docker environment using meticulously crafted YAML files
- Collaborated on packaging and deploying the pipeline as a Cloud Native Application Bundle (CNAB) using porter on Google Cloud Platform
- Integrated NGINX for network monitoring and security in the Docker ecosystem
- Demonstrated advanced Git proficiency in version control and collaborative development workflows

PROJECTS

Dynamic Cluster Management in Kubernetes Ecosystem

- Orchestrated a resilient 3-node Kubernetes cluster using kubeadm, kubectl, and kubelet in a CloudLab Linux virtual environment
- Monitored system metrics, scripted CPU utilization tracking with Kubernetes Python SDK and Metrics Server
- Engineered first-order linear models with local and global PI controllers for optimizing pod allocation, targeting 80% CPU utilization
- Designed Flask REST APIs for dynamic node management, handling job assignment, cordon/restore node tasks, and system state retrieval

Network Topology Simulation & Performance Evaluation

- Conducted extensive experiments using MiniNet to simulate diverse network topologies in a Linux environment
- Executed ping tests, TCP Iperf simulations, and UDP Iperf simulations to measure and analyze latency, throughput, and jitter
- Provided valuable insights applicable to network design decisions
- Collaborated within a team to conduct simulations, collate results, and present findings

F5 Hackathon: Foodbank Food App

- Led a team of four interns to develop the first-place-winning application in a companywide Hackathon
- Created the "Foodbank Food App", a web application to facilitate easy donations to nearby foodbanks
- Developed middleware to obtain foodbank information by coding a Python script that utilized the Google Maps SDK and API
- Employed data extraction techniques to retrieve specific details such as the name, location, and contact numbers of foodbanks, prioritized by proximity to the end user.

AWS Serverless BMI Calculator

- Deployed a serverless web application on AWS, leveraging S3 for storage and Route 53 for domain management
- Leveraged AWS Lambda for serverless JavaScript, enabling real-time BMI calculations with API Gateway for function triggering
- Implemented IAM policies to fortify application security by precisely defining access permissions within the AWS environment