HAMZA KAMEL

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EDUCATION

Purdue University, West Lafayette, IN — May 2025
Master of Science in Electrical and Computer Engineering
Specialization: Innovative Technologies

Purdue University, West Lafayette, IN — May 2023
Bachelor of Science in Computer Engineering

TECHNICAL SKILLS

- Programming Languages, Tools, and Knowledge: Computer Architecture, Computer Vision, Git, GitHub, C, C++, Rust, Java, JavaScript, TypeScript, Bash, Assembly Language, Python, System Verilog, Machine Learning, AI
- Language: Fluent in reading, writing, and speaking Arabic

PROFESSIONAL EXPERIENCE

Translating C to Safe Rust, Purdue University — May 2024 – August 2024
Graduate Student Researcher

- Converted complex C data structures, such as doubly linked lists, into safe, idiomatic Rust; for example, we used Rc<RefCell<T>> to ensure memory safety and correct functionality
- Utilized the converted Rust code as a baseline to compare with code generated by the C2Rust tool
- Leveraged CMake, Cargo, and Bear to automate the building and testing of programs

Advanced C Programming, Purdue University — August 2022 – December 2022
Undergraduate Teaching Assistant

- Enhanced and sustained proficiency in C programming by guiding approximately 200 Computer Engineering students through regular office hours, fostering their understanding of programming concepts
- Strengthened students' problem-solving skills by reviewing C content and preparing them for homework and exams
- Curated student questions to improve tutoring solutions discussed in weekly staff meetings

Neurava, Purdue Research Park, Startup Company Backed by Purdue University — May 2022 – August 2022
Firmware Engineering Intern

- Manufactured new firmware for a smart wearable device capable of tracking the vital signs of people at risk of SUDEP (Sudden Unexpected Death in Epilepsy) to give advanced warning
- Programmed in C and Python to establish real-time communication with the microcontroller using radio frequencies, ensuring consistent data updates
- Tested SPI frequencies through trial and error to acquire the most consistent results with the fastest running time and conclusively identified the 2.048 MHz SPI frequency as optimal due to its exceptional code performance
- Utilized I2C and SPI to interface with various chips for real-time physiological data acquisition

PROJECT EXPERIENCE

Load Value Prediction Project in Gem5, Purdue University — August 2024 – December 2024

- Modified the execute stage and LSQ of the MinorCPU, benchmarking it with a total of 20 billion instructions
- Implemented a load value prediction table with a 2-bit confidence counter to enhance load prediction accuracy
- Created a Constant Verification Unit to handle loads with maximum confidence to streamline loads and reduce stalls

Aqua-Check, Master's Project Track, Purdue University — August 2023 – May 2024

- Led a six-member team for Aqua-Check, overseeing software goals, data selection, and core programming functions
- Conducted extensive research on bioimpedance values, specifically focusing on the relationship between bioimpedance and total body water, with emphasis on parameters such as resistance (R) instead of reactance (Xc)
- Implemented gradient boosting algorithms (Linear Regression, XGBoost, LightGBM) in Python to estimate individual total body water (TBW) content in kilograms and determine their corresponding hydration category

Digital Systems Senior Design, Purdue University — August 2022 – December 2022

- Incorporated a CC1310 microcontroller and coded instructions in C using Code Composer Studio
- Developed SPI, UART, and Radio protocols to operate concurrently, facilitating the creation of changing light effects on programmable light strips through seamless communication and by setting SPI to a high speed of 2.4 MHz
- Created a robust transmission system for radio communication between a central controller and receivers, efficiently sending 135 bytes of data at each trigger, enabling dissemination of diverse light effects to multiple receivers

LEADERSHIP EXPERIENCE

Eta Kappa Nu (HKN), IEEE Honor Society — December 2023 – Present

Purdue Engineering Outreach (PEO), Organization Teaching Engineering Concepts for K-12
President — April 2022 – May 2023

- Oversaw club funds, relations, activities, and events, fostering an inclusive environment for teaching engineering