

Areas of Interest

- Artificial Intelligence
- Computer Engineering
- Software Engineering
- Robotics

Portfolio Links

LINKEDIN: <https://www.linkedin.com/in/maria-alabdulrahman-843165109/>

GITHUB: <https://github.com/mariaalabdulrahman>

SCHOLAR: <https://scholar.google.com/citations?user=c5PnD-0AAAAJ&hl=en>

Education

- **3.98/4, Bachelor of Science**, Prince Mohammad Bin Fahd University

2020-2024

○ Double Major in Computer Engineering and Software Engineering

○ ABET Accredited Program

○ Graduation date: July 2024

○ Dean’s Honor List Student
- **Artificial Intelligence Summer Program**, SDAIA-KAUST Academy

2023-2023

○ 320 hours of training from AI experts

○ Completed an NLP project utilizing AI tools
- **3.55/4, American High School Diploma**, International Programs School

2013-2020

○ Awarded the International Baccalaureate Diploma

○ Honors Roll List Student

Experience

January 2023 – October 2023: **Part-Time Research Assistant**, Prince Mohammad Bin Fahd University
June 2022 – August 2022: **Robotics Engineer Intern**, Robotics Lab at Prince Mohammad Bin Fahd University

Skills/Tools

Artificial Intelligence	Tensorflow, PyTorch, Scikit-Learn, Pandas, NumPy, Prompt Engineering
IoT and Robotics	Arduino, Raspberry Pi, Jetson Nano, ROS2
Web Development	Flask, HTML, JS, jQuery, CSS, ASP.NET
Languages	Java, Python, JavaScript, C#, C++, Visual Basic
3D Modeling	TinkerCad, Autodesk Fusion360
Productivity Tools	Word, Excel, PowerPoint, Overleaf

Projects

- **Senior Project: DASH - Advanced Quadruped Robot**
 - Engineered DASH from scratch, creating a robust quadruped robot using brushless motors, motor drivers, absolute encoders, and arduinos for stable movement.
 - Implemented functionalities with ROS2, integrating AI features with CV and NLP.
 - Developed a mobile app and a touchscreen UI for intuitive user interaction.
- **Segmentation and Classification of Potholes using Instance Segmentation Methods and Decision Trees**
 - Images depicting potholes were collected (17400 images).
 - An Instance Segmentation model was trained (YoloV8).
 - Structural features such as pothole area, height and width were extracted from the segmented images.
 - A decision tree classifier is trained on the extracted features; highest accuracy yielded was 98.9%.
- **Arabic Offense Text Identification and Classification**
 - Developed and implemented a robust system for classifying Arabic tweets into categories.
 - Utilized text representation techniques, including TF-IDF, BoW, RNN, AraBERT, and mBERT.
 - Achieved an 89% accuracy in classification with TF-IDF and BoW methods.
- **Traffic Detection System Project**
 - Developed a computer vision-based traffic detection system using the Kaggle Traffic Detection dataset.
 - Utilized the YOLOv8n model with the Ultralytics library for training.
 - Achieved strong performance in vehicle classes (Bus, Car, Bicycle, Motorbike) with precision of 91.8% and recall of 89.7%.
- **SARID: Arabic Story Generator using a Fine-Tuned Large Language Model and Text-to-Image Generation**
 - Web Scraping 527 stories which were used to fine-tune a pre-trained LLM (Davinci-003).
 - Generated corresponding images using Midjourney for a cohesive storytelling experience.
 - Developed a user-friendly interface enabling users to input preferences to generate personalized stories.
- **Haptic VR glove for Unity using Arduino**
 - A glove was constructed using IMUs and flex sensors which collected hand movement data
 - The data was fed to a Unity environment, where a virtual hand reflects the hand movement from the glove
 - Events in the virtual environment result in haptic feedback on the glove
- **Inventory Management System using Deep Learning (No QR/Barcodes)**
 - Items are recognized by a raspberry pi through a live video feed from a webcam.
 - Users can check-in and check-out items. The inventory database is updated accordingly.
 - Web application that displays inventory, stock, check-outs, and user information.
 - New items can be registered by an admin and images of new items are used to retrain the deep learning model.
- **Simulation-based Learning Environment for Operating System Algorithms**
 - Web application that displays interactive simulations for Operating Systems algorithms.
 - Simulations include Job Scheduling, Memory Page Replacement, Round Robin, etc.
- **Airline Management System**
 - Web application for airline management with a backend managed by a Flask server.
 - SQLite database with seven entities manages the airline system.
 - Customized chatbot using OpenAI API.
- **Electronic Xylophone with LCD using Arduino**
 - A system that is designed to teach beginners how to use a xylophone.
 - An array of momentary switches correspond to a note on the xylophone.

- LCD displays the note played by the user.
- **Robotics Lab Stock Management Web Application**
 - A NodeJS based server handles GET and POST requests from users that borrow items from the robotics lab.
 - Displays stock information of robotics lab and gives controlled access to admins to update stock information.

Research Publications

- Alotaibi, L., **Alabdulrahman, M.**, Hasanaath, A. A., Tohmeh, S. B., & Mohammad, N. (2022, December). **Low Cost and Scalable Haptic VR Glove**. In *2022 14th International Conference on Computational Intelligence and Communication Networks (CICN)* (pp. 343-349). **IEEE**.
- **Alabdulrahman, M.**, Khayyat, R., Almowallad, K., & Alharz, Z. (2024, March). **Sarid: Arabic Storyteller Using a Fine-Tuned LLM and Text-to-Image Generation**. In *2024 16th International Conference on Computer and Automation Engineering (ICCAE)* (pp. 1-5). **IEEE**.

Achievements & Awards

- **First Place in IEEE Coding Competition**, IEEE (2022)
- **SDAIA-KAUST Academy Introduction to AI Bootcamp**, KAUST (2022)
- **SDAIA-KAUST Academy Advanced Artificial Intelligence Course**, KAUST (2023)
- **Best Presentation award for the Digital Image Processing and Methods session**, ICCAE (2024)
- **Networking Academy Course Cybersecurity Essentials**, Cisco (2022)
- **Dean's Honor List**, PMU (2021-2024)
- **International Baccalaureate Diploma**, IBO (2020)

Extra-Curricular Activities

- Founder and Vice President of **Robotics Society**, PMU
- Presented a research paper in **The 16th International Conference on Computer and Automation Engineering (ICCAE 2024)**
- Facilitated a Reinforcement Learning Workshop organized by **Robotics Society**, PMU
- Facilitated a Generative AI Workshop organized by **Robotics Society**, PMU
- Presented a research paper in **Computational Intelligence and Communication Networks (CICN2022)**
- President of **Undergraduate Research Society**, PMU
- Mentor in the **CS1 Help Session Program**, Computer Collaro Club, PMU
- Secretary of **IEEE Women in Engineering**, PMU
- Core member of **Google Student Developer Club**, PMU
- Member of **IEEE Robotics and Automation Society**
- Main-Attack of the **Basketball Team**, PMU
- Managed an AMA booth with colleagues for the **Robotics Society**, PMU
- Organized Arduino Workshop held by **IEEE Women in Engineering Chapter**, PMU