Lara Alotaibi

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Portfolio Links

LINKEDIN: https://www.linkedin.com/in/lara-alotaibi-380121242/ **GITHUB**: https://github.com/Larito

WEBSITE: https://larito.github.io/Lara-Portfolio.github.io/

SCHOLAR: https://scholar.google.com/citations?user=YrH5p9gAAAAJ&hl=en&authuser=1

Education

- 3.67/4, **Bachelor of Science**, Prince Mohammad Bin Fahd University (PMU) 2020-2024
  - **Double Major in Software Engineering and Computer Engineering**
  - ABET Accredited Program
  - Dean's Honor List Student
- 91.88/100, **American High School Diploma**, Saad National School for Girls 2018-2020

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.
June 2023 - August 2023: **Data Scientist Intern,** Saudi Aramco

Skills/Tools

Web Development	Flask, HTML, JS, jQuery, CSS, ASP.NET
Artificial Intelligence	PyTorch, Sklearn, Pandas, NumPy, Tensorflow, Prompt Engineering
Languages	Java, Python, JavaScript, C#
3D Modeling	TinkerCad, AutoCad Fusion360
Electronics and Robotics	Arduino, Raspberry Pi, ROS2
Productivity Tools	Word, Excel, PowerPoint, Overleaf

Relevant Projects

- **DASH, Quadruped Robot Development Kit**
  - Led 3D modeling, printing, and assembly processes for precise hardware integration.
  - Integrated Robotics Operating System 2 (ROS2) for core functionalities, including gesture control and person following.
  - Implemented vision-based systems with a camera and touchscreen UI for enhanced interaction.
  - Developed a custom mobile app enabling remote control and seamless user interaction.
  - Focused on kinematic modeling and motor control for stable and dynamic movement.
- **Voice-Controlled Robotic Vehicle (VCRV)**
  - to enhance mobility for individuals with disabilities.
  - Utilized ESP8266 NodeMCU 1.0 microcontroller for central control and WiFi-enabled communication.
  - Integrated voice recognition module for precise execution of voice commands.
  - Implemented ultrasonic sensor for accurate obstacle detection and avoidance.
  - Designed a user-friendly GUI to facilitate easy interaction with the vehicle.

- Achieved real-time responsiveness and minimal latency in command execution.

- **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**
  - Evaluate Bag-of-Words (BoW), TF-IDF, custom embeddings, and pretrained embeddings
  - Highest accuracy of 89.23% achieved with Random Forest on 3 classes
  - Reduction of classes from 5 to 3 improved model performance
  - Random Forest consistently performed well, with competitive results from Logistic Regression and SVM
- **Traffic Detection**
  - Yolov8n model was employed for the project's training phase
  - Execution of training was carried out on Kaggle, utilizing the T4 GPU
  - Model demonstrated good performance, especially on vehicle classes (Bus, Car, Bicycle, Motorbike) in terms of precision, recall, and F1 score
  - It yielded a mean average precision of 83.5%, precision of 85.4%, and recall of 75.3%.
- **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 data collected from the glove
  - Events in the game result in haptic feedback on the glove

Research

Publications

- **Lara Alotaibi, et al, "Low Cost and Scalable Haptic VR Glove"**, International Conference on Computational Intelligence and Communication Networks, **CICN, Dec 2022, Khobar KSA**
- **Lara Alotaibi, et al, "Cyberattacks Using ChatGPT: Exploring Malicious Content Generation Through Prompt Engineering"**, International Conference in Emerging Technologies for Sustainability and Intelligent Systems, **ICETSIS, Jan 2024, Kingdom of Bahrain**

Achievements & Awards

- **SDAIA-KAUST Academy Introduction to AI Bootcamp,** KAUST (2022)
- **Dean's List Honors**, Prince Mohammad Bin Fahd University (2020, 2023)
- **MISK Distinctive** College Prep Program, (2018)
- **Harvard Summer School Scholarship,** completed 2 college-level courses (2018)

Extra-Curricular Activities

- Founder and President of **Robotics Society, PMU**
- **Tutoring CS1 Students**, College of Computer Engineering & Sciences PMU
- Facilitated Reinforcement Learning Workshop organized by **Robotics Society, PMU**
- Conducted 3D Printing Workshop organized by **Robotics Society, PMU**
- Vice President of **Undergraduate Research Society, PMU**
- Treasurer of **IEEE Women in Engineering, PMU**
- Mentor in the **MISK mentoring program**