

Ibrahim Aldarmaki

Research Assistant at Khalifa University
Abu Dhabi, United Arab Emirates

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EDUCATION

The University of Edinburgh <i>BEng (Hons.) in Electronics and Electrical Engineering</i> <i>First Class Honours</i>	Sep 2020 – May 2023 <i>Edinburgh, UK</i>
United Arab Emirates University (Transferred) <i>BSc in Electrical Engineering</i> <i>GPA: 4.00/4.00</i>	Aug 2019 – July 2020 <i>Al Ain, UAE</i>
Applied Technology High School <i>Advanced Science Program (ASP)</i> <i>Class Rank: 1</i> <i>Country Rank: 6</i>	Aug 2019 – July 2020 <i>Fujairah, UAE</i>

EXPERIENCE

Research Assistant <i>Khalifa University</i>	Sep 2024 – Present <i>Abu Dhabi, UAE</i>
<ul style="list-style-type: none">Conducting research on Wi-Fi sensing for healthcare applications, with a focus on signal processing and machine learning techniques to enhance sensing accuracy and reliability.Developing software designs and solutions for real-time Wi-Fi sensing using off-the-shelf hardware.	
Research Assistant <i>Mohammed Bin Zayed University of Artificial Intelligence</i>	Dec 2023 – April 2024 <i>Abu Dhabi, UAE</i>
<ul style="list-style-type: none">Investigating generative and predictive code-switching models, utilizing pre-trained Large Language Models (LLMs) to advance multilingual code-switching prediction and generation.Worked on deep neural networks for Multichannel Speech Enhancement and developed a novel, parameter-efficient MSE neural architecture.	
Signal Processing Summer School <i>University Defense Research Collaboration (UDRC)</i>	Jun 2023 <i>Edinburgh, UK</i>
<ul style="list-style-type: none">Engaged in theoretical and practical sessions in statistical signal processing, tracking & sensing, machine learning, and source separation.	
Teaching Assistant <i>The University of Edinburgh</i>	Sep 2022 – May 2023 <i>Edinburgh, UK</i>
<ul style="list-style-type: none">Served as a teaching assistant for the third-year digital systems design course, guiding students in developing synchronous digital circuits and realizing finite-state machines from high-level functional specifications and prototyping them on FPGA hardware.Facilitated the learning process in the second-year digital systems design course in analyzing and designing combinational and sequential gate-level circuits.	
Space Science Researcher <i>Mohammed Bin Rashid Space Centre</i>	Jun 2022 – Aug 2022 <i>Dubai, UAE</i>
<ul style="list-style-type: none">Studied the Martian surface diurnal temperature and characterized its thermophysical properties using observed diurnal temperatures taken by Emirates Mars Mission's (EMM) Emirates Mars Infrared Spectrometer (EMIRS) instrument.Developed and presented thermophysical properties estimation algorithms that surpassed current industry standards in accuracy and efficiency.	

SELECTED PROJECTS

Navigating Through The Unknown Jupyter Notebook	Nov 2023
<ul style="list-style-type: none">Developed a simulation of dynamic system behavior and sensor inputs, incorporating noise to model real-world measurement uncertainty.Designed and implemented a Kalman filter for accurate state (position and velocity) estimation, refining the object's trajectory by combining model predictions with noisy measurements.	
DNNs for DoA Estimation using Circular Microphone Arrays Bachelors Thesis	Sep 2022 – May 2023

- Conducted research on signal processing and machine learning algorithms to use Deep Neural Networks (DNNs) Direction of Arrival (DOA) estimation.
- Developed speaker localization algorithms using statistical signal processing and deep learning techniques, achieving a 36% improvement in performance over standard algorithms.

RISC Microprocessor & Remote Car Interface Development

Jan 2023 – Apr 2023

- Developed a RISC Microprocessor using Verilog HDL and prototyped it on a FPGA board.
- Created a customized programming language and compiler to optimize the processor's programming efficiency and functionality.
- Developed a remote car interface that uses the processor to control the car's movement and utilized a VGA display to show the control interface.

Sentiment Analysis of Text

Mar 2023

- Performed sentiment analysis and visualization on social media platforms, such as Twitter (now known as X), and review text data.
- Developed and optimized machine learning and deep learning algorithms to estimate sentiment in raw text data, selecting the most effective approach.

Visible Light Communication System Design and Implementation

Jan 2022 – Mar 2022

- Designed and constructed a robust optical communication system by leveraging expertise in PCB design, assembly, component testing, and soldering, ensuring optimal performance and reliability.

PUBLICATIONS

Ibrahim Aldarmaki, Thamar Solorio, Bhiksha Raj, Hanan Aldarmaki, "RelUNet: Relative Channel Fusion U-Net for Multichannel Speech Enhancement," arXiv:2410.05019, 2024. [Online]. Available: <https://arxiv.org/abs/2410.05019>

TECHNICAL SKILLS

Python, PyTorch, TensorFlow, Scikit-Learn, MATLAB, Minitab, Java, C, LTSpice, Xilinx, Verilog HDL, Basys3 FPGA, STM32 Board