# Islam M. Tayeb

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## EDUCATION

**Duke University** *Durham, NC*

B.S. in Computer Science, Minors in Bioinformatics & Chemistry *Expected 2027*

**Relevant Coursework:** Data Structures and Algorithms, Computer Architecture, Linear Algebra, Organic Chemistry

## EXPERIENCE

**Research Analyst Intern** – Duke Institute for Health Innovation *Jun 2024 – Aug 2024*

- Developed an LLM agent using **AutoGen** and **Llamma** to compile research paper databases and create literature reviews on user-selected topics, funded by the *Health AI Partnership*
- Building a multimodal deep learning predictive model for hospital-acquired thrombosis to be utilized by *Duke Health*
- Implemented solutions for backend problems in internal products, improving performance speed by 5-15% for each

**Software Engineering Intern** – Project: Sapien *Dec 2023 – Jan 2024*

- Created full-stack semantic analysis tools using **BERT**-based models to help population health scientists extract structured data from unstructured surveys
- Led data collection for pilot tests, coordinating with faculty and surveying 4,000+ students to create a diverse dataset

**Research Assistant** – King Fahd University of Petroleum & Minerals *Jul 2022 – Sep 2023*

- Created a **GC Monte Carlo simulation** statistical model, predicting 6 properties of 3 novel $CO_2$-capturing materials
- Developed phloroglucinol polymers and MOF analogues for direct $CO_2$ and $H_2O$ capture for 2 *Saudi Aramco* projects

**Research Assistant** – King Abdulaziz University *Aug 2021 – Jun 2022*

- Utilized **ANOVA** algorithms and **Nextflow** to measure genetic variation and phylogeny of 5 Capparis plant species
- Analyzed needle biopsies, CT scans, and immunostaining results to assist doctors in detecting early-stage cancer

## PROJECTS

**CT Medical Imaging Classification**

- Cleaned data and implemented a **YOLOv8** computer vision model to identify tumors from CT scans

**Simulated Hand Balancing a Stick Using Genetic Algorithms**

- Developed a **genetic algorithm** to manage a simulated hand's motion for balancing a stick
- Optimized efficiency by integrating the genetic algorithm with a **feedback loop**, enhancing the stick's balance

**Wearable Carbon Fibre Sensors for Health Monitoring**

- Optimized 5 biosensors, improving accuracy by 23% compared to stock and receiving a $5,000 grant with a team
- Implemented a live performance scoring interface using **Angular** to increase user engagement

**AI-Powered Smart Drones for Wildfire Prevention**

- Developed a real-time **YOLOv5** computer vision model to train a drone's sensors/camera input to detect wildfires

## SELECTED PUBLICATIONS

- Abdelnaby, M., **Tayeb, I.**, Alloush, A., Alyosef, H., Alnoaimi, A., Zeama, M., Mohammed, M., Onaizi, S. (2024). Post-synthetic modification of UiO-66 analogue metal-organic framework as potential solid sorbent for direct air capture, *Journal of $CO_2$ Utilization, Volume 79*
- Alsulaiman, A., Alharthi, S., Albariqi, A., Mutabaqani, R., Bokhari, F., **Tayeb, I.**, et al. (2022). KRAS G12C-Mutant Non-Small-Cell Lung Adenocarcinoma: First Documented Report in the Arabian Gulf. *Cureus, 14*

## ACHIEVEMENTS

**#5 / 100+ teams – Finalist**; DataFest, American Statistical Association (Data Analysis & Modeling) *Mar 2024*

## SKILLS

**Languages:** Python, TypeScript/JavaScript, Java, SQL, R, C, MATLAB **Deployment:** Git, Docker, Vercel
**Machine Learning:** NLTK, SKL, TensorFlow, PyTorch, Transformer Models (BERT, GPT, Gemini, Llama)
**Web/App Development:** React, Angular, Streamlit, PostgreSQL, HTML/CSS, Framer Motion, SCSS