Omar Rayyan

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Education

New York University Abu Dhabi (NYUAD) — August 2021 - May 2025
Double Major in Electrical Engineering & Computer Science — **GPA: 4.0/4.0**

IEC High School — August 2018 - May 2021
Cambridge A-Levels, Highest Grade in Physics and 7 IGCSES across region — **GPA: 100.0/100.0**

Publications

RCM-Constrained Manipulator Trajectory Tracking using Differential Kinematics — ICAR 2023
***Rayyan, O.**, Gonçalves, V., Evangeliou, N., & Tzes* — *First-Author Conference Paper*

Research Experiences

People, AI and Robotics Lab — Advised by Prof. Animesh Garg (Georgia Tech) — July 2024 - Present
Research Assistant — *Atlanta, US*

- Working on a scalable data collection framework for imitation learning, enabling large-scale parallelized data collection via pose-following inputs from widely accessible devices

General Robotics and AI Lab — Advised by Prof. Lerrel Pinto (NYU) — January 2024 - Present
Research Assistant — *New York, US*

- Leading the **UntidyBot** project, a mobile manipulation framework designed to execute logical sequential actions in diverse environments beyond standard pick-and-place tasks, in collaboration with **Mahi Shafiullah**.
- Incorporating affordance metrics into ConceptGraph to represent objects articulabilities and interactions, adding dynamics to graph-based task planning
- Open-sourced **MuJoCo AR**, a plugin enabling real-time integration of ARKit data from iOS devices to control MuJoCo frames and real robots

Center for AI and Robotics — Advised by Prof. Tzes (NYUAD) — September 2022 - September 2023
Research Assistant — *Abu Dhabi, UAE*

- Led the project to develop a surgical robotics controller capable of tracking trajectories within enclosed body cavities while minimizing insertion point impact on the skin
- Formalized the Remote Center of Motion (RCM) constraint as an algorithmically optimizable task function for general-purpose robotic manipulators, diverging from the mechanically constrained approach of Da Vinci systems
- Published and presented this work as a first-author at the International Conference on Advanced Robotics **(ICAR)**

Applied Interactive Multimedia (AIM) Lab — NYUAD — February 2022 - July 2022
Student Researcher — *Abu Dhabi, UAE*

- Developed rehabilitation tasks using kinesthetic feedback via under-screen magnets to aid post-stroke recovery, in collaboration with Cleveland Clinic Abu Dhabi physicians
- Designed and developed serious games to help children develop handwriting skills, with input from education professionals at Cranleigh School Abu Dhabi

Professional Experiences

Google — Jul 2023 - Sep 2023
Software Engineering Intern — *Munich, Germany*

- Developed a tool for the **Google Space Control** team to automatically evaluate changes in resource configurations before their integration into the Google Cloud reliability pipeline
- My project earned an award by the team for creating an impact on their workflow during my internship

Awards and Honors

Comma.ai Controls Competition 2024
- 1st place in comma.ai's controls challenge by training a DDPG reinforcement learning agent to steer a car

Rhodes Finalist 2024
- Selected as a finalist for the prestigious Rhodes Scholarship, awarded for academic excellence and leadership

IEEEXtreme Coding Competition Podiums 2022/23 & 2023/24
- Led a team to rank 3rd in 2023 and 4th in 2022 across the region at IEEE's programming competition

Alfred H. Bloom Scholar 2024
- Granted annually to **one** student for excellence in experiential learning and academic performance - Letter

Deep Learning Graduate Course Competition 2024
- Led an undergraduate team to podium in the graduate-level deep learning course competition at NYU

Cambridge Outstanding UK Learner Award 2021
- Achieved the highest mark in country in my Physics A-Level, and across 7 IGCSEs

Select Projects

UntidyBot May 2024 - In Progress
- Mobile manipulation framework for executing logical sequential actions in diverse environments beyond pick-and-place tasks with PhD Mahi Shaifullah

Portable Framework for Scalable Robot Policy Learning May 2024 - In Progress
- Leading graduation project in creating a portable device for portable non-teleoperation data collection.
- Implemented a data-processing and training pipeline for the Action Diffusion Policy and VQ-BeT architectures.

MuJoCo AR August 2024
- A plugin that enables the streaming of ARKit data from a connected iOS device for robot teleoperation in MuJoCo frames and beyond. Installed 12k+ times in the past two months
- Designed and implemented a list of environments and tasks in MuJoCo accompanying the plug-in.

LEBSI November 2021 - May 2022
- Developed an app that enables people to set up online clothing stores in minutes. Reached #22 on the AppStore top charts.

Past Code January 2021 - May 2022
- Developed an app that uses Apple's vision framework to help students find supporting papers with over 500,000 usages.

Please check www.orayyan.com for a full list of my projects and experiences.

Extracurricular and Leadership

Artificial Intelligence Connect Student Club August 2024 - Present
- Vice President of the Artificial Intelligence student club at NYUAD, where I initiated a bi-weekly reading group for students to discuss recent machine learning research papers

Competitive Cubing (Rubik's Cube) January 2017 - Present
- Set the official 4x4 **national record** (average and single) at an official WCA cubing competition
- Competed in cubing events in Amman, Manama, New York, and Abu Dhabi
- Led a Rubik's Cube speed-solving workshop at ZINC (Zain Innovation Campus)

NYUAD 12th & 11th Hackathon for Social Good April 2022 & April 2023
- Led the development team at NYUAD's Hackathon for Social Good to develop Tanabu, a package using machine learning to improve energy grid maintenance predictions

Blood Donation App (Qatra) April 2021
- Developed an app to streamline the process for hospitals to find compatible blood donors in urgent cases
- Featured in a news segment in Jordan news