

# Omar Rayyan

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## EDUCATION

<b>New York University Abu Dhabi (NYUAD)</b> <i>Double Major in Electrical Engineering &amp; Computer Science</i>	August 2021 - May 2025 <b>GPA: 4.0/4.0</b>
<b>IEC High School</b> <i>Cambridge A-Levels, Highest Grades in Physics &amp; Mathematics across region</i>	August 2018 - May 2021 <b>GPA: 100.0/100.0</b>

## PUBLICATIONS

<b>RCM-Constrained Manipulator Trajectory Tracking using Differential Kinematics</b> <i>Rayyan, O., Gonçalves, V., Evangeliou, N., &amp; Tzes</i>	ICAR 2023 <i>First-Author Conference Paper</i>
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## RESEARCH EXPERIENCES

<b>People, AI and Robotics (PAIR) Lab</b> — <i>Georgia Institute of Technology</i> <i>Research Assistant</i>	July 2024 - Present <i>Atlanta, US</i>
<ul style="list-style-type: none"><li>Designing and developing <b>RoboTurk-v2</b>, a scalable data collection framework for imitation learning, enabling large-scale parallelized data collection via pose-following inputs from widely accessible devices</li><li>Designed and implemented custom environments and robotic manipulation tasks in MuJoCo and Isaac Gym to enable scalable and efficient teleoperation for data-driven robotic learning</li><li>Advised by <b>Prof. Animesh Garg</b>, Senior Research Scientist at NVIDIA, on track to submit our work to the Robotics: Science and Systems (<b>RSS</b>) <b>2025</b> Conference</li></ul>	
<b>General Robotics and AI Lab (GRAIL)</b> — <i>NYU</i> <i>Research Assistant</i>	January 2024 - Present <i>New York, US</i>
<ul style="list-style-type: none"><li>Leading <b>UntidyBot</b> project, a mobile manipulation framework for executing logical sequential actions in diverse environments beyond pick-and-place tasks. It incorporates affordance metrics into ConceptGraph to represent objects articulability and enhance graph-based task planning</li><li>Open-sourced <b>MuJoCo AR</b>, a plugin enabling real-time integration of ARKit data from iOS devices to control MuJoCo frames and real robots</li><li>Advised by <b>Prof. Lerrel</b> and <b>Mahi Shafiullah</b> from NYU Courant</li></ul>	
<b>Center for AI and Robotics (CAIR)</b> — <i>NYU Abu Dhabi</i> <i>Research Assistant</i>	September 2022 - September 2023 <i>Abu Dhabi, UAE</i>
<ul style="list-style-type: none"><li>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</li><li>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</li><li>Published and presented this work as a first-author at the International Conference on Advanced Robotics (<b>ICAR</b>)</li></ul>	
<b>Applied Interactive Multimedia (AIM) Lab</b> — <i>NYU Abu Dhabi</i> <i>Student Researcher</i>	February 2022 - July 2022 <i>Abu Dhabi, UAE</i>
<ul style="list-style-type: none"><li>Developed rehabilitation tasks using kinesthetic feedback via under-screen magnets to aid post-stroke recovery, in collaboration with Cleveland Clinic Abu Dhabi physicians</li><li>Designed and developed serious games to help children develop handwriting skills, with input from education professionals at Cranleigh School Abu Dhabi</li></ul>	

## PROFESSIONAL EXPERIENCES

<b>Google</b> <i>Software Engineering Intern</i>	Jul 2023 - Sep 2023 <i>Munich, Germany</i>
<ul style="list-style-type: none"><li>Developed a tool for the <b>Google Space Control</b> team to automatically evaluate changes in resource configurations before their integration into the Google Cloud reliability pipeline</li><li>My project earned an award by the team for creating a big impact on their workflow during my internship</li></ul>	

## AWARDS AND HONORS

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- Rhodes Finalist** November 2024
- Selected as a finalist for the highly prestigious Rhodes Scholarship, awarded for academic excellence and leadership
- Alfred H. Bloom Scholar** June 2024
- Granted annually to **one** student for excellence in experiential learning and academic performance - [Letter](#)
- Comma.ai Controls Competition** May 2024
- 1<sup>st</sup> place in comma.ai's controls challenge by training a DDPG reinforcement learning agent to steer a car
- Deep Learning Graduate Course Competition** April 2024
- Led an undergraduate team to podium in the graduate-level deep learning course competition at NYU
- IEEEExtreme Coding Competition Podiums** October 2022 & October 2023
- Led a team to rank 3<sup>rd</sup> in 2023 and 4<sup>th</sup> in 2022 across the region at IEEE's programming competition
- Cambridge Outstanding UK Learner Award** May 2021
- Achieved the highest mark in country in my Physics A-Level, and across 7 IGCSEs

## SELECT PROJECTS

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- Portable Framework for Scalable Robot Policy Learning** August 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 architecture.
- RoboTurk-v2** July 2024 - In Progress
- A successor to [RoboTurk](#) in collaboration with a team from Georiga Tech. Advised by Prof. Animesh Garg
- UntidyBot** May 2024 - In Progress
- Mobile manipulation framework for executing logical sequential actions in diverse environments beyond pick-and-place tasks. Advised by PhD Mahi Shaifullah
- 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
- Implemented an [app](#) that uses Apple's vision framework to help students find supporting papers with over 500,000 usages.

Please check [www.orayyan.com](http://www.orayyan.com) for a full list of my projects and experiences.

## EXTRACURRICULAR AND LEADERSHIP

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- SyriaScript Refugees Instructor and Teaching Assistant** August 2024 - Present
- Giving online lectures on neural network architectures for refugees enrolled in *Introduction to Data Science and Machine Learning* through the SyriaScript program
- Artificial Intelligence Connect Student Club** August 2024 - Present
- Associate 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 3x3, 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