NIA RALSTON

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EDUCATION

Master of Applied Science, Mechanical and Materials Engineering, Queen's University, Kingston, ON **2024 – 2027**

- 4.3/4.3 GPA.
- Awarded NSERC Graduate Scholarship to pursue research on the development of an inflatable pneumatic humanoid robot.
- Developed bipedal walking simulations in MATLAB and MuJoCo, implementing a variety of controllers with compliant walking models to analyze inflation-based stability approaches.
- Investigating inflatable legs and feet for improved bipedal gait dynamics, stability, and efficiency through a custom-built inflatable biped robot prototype. Research to be presented at IROS 2025.

Bachelor of Applied Science, Mechanical Engineering, Queen's University, Kingston, ON **2020 – 2024**

- GPA of 4.02/4.3, awarded the Milbourne-Glen Scholarship for highest GPA in the graduating materials subdiscipline class.
- Recipient of the Queen's University Principal's Merit Scholarship, TARRA Scholarship, and the Deans Distinction Award.

WORK EXPERIENCE

Teaching Assistant, Queen's University, Kingston, ON **Sep 2023 – Current**

- Assisted in seven engineering courses, primarily mechatronics courses, leading labs, tutorials, and marking.

Intern, ASTM International Exo Technology Center of Excellence, Conshohocken, PA **May 2024 – Aug 2024**

- Reviewed latest advancements in exoskeleton technology to maintain an up-to-date research database.
- Contributed to standard development in the ATSM F48 (exoskeletons and exosuits) and F45 (robotics) committees.
- Supported planning of the 2024 Exo Games, a global competition showcasing innovations in exoskeletons.

Research Assistant, Ingenuity Labs, Kingston, ON **Jan 2023 – April 2024**

- Funded position by acquiring a research grant from the Natural Sciences and Engineering Research Council of Canada.
- Developed a terrain-adaptive robot designed to address the challenges faced by traditional wheeled robots on soft terrains.
- Designed and implemented PCBs to facilitate sensor integration, improving real-time decision-making.
- Submitted a paper for consideration at ICRA 2024 conference.

Consultant, MEDATech, Collingwood, ON **Sep 2023 – April 2024**

- Redesigned a high-voltage power distribution unit to enhance modularity, streamlining the production process.
- Designed CAD models to secure accurate contractor quotations, ensuring cost estimation aligns with budget constraints.
- Developed test procedures and conducted thermal simulations to evaluate and ensure product reliability under various operating conditions.

Supervisor, SparQ, Kingston, ON **Aug 2023 – April 2024**

- Instructed entrepreneurs in machinery for prototyping and led tutorials on 3D printing and soldering.

Robotics Engineering Intern, AI Trillium, Kingston, ON **May 2022 – Aug 2022**

- Developed control algorithms applying inverse kinematics and path planning, enabling robotic arms to play chess.
- Refined the algorithm to accommodate various arm designs.
- Implemented circuitry to allow for real-time visualization of chess piece positions.

Math Instructor, Mathnasium, Basking Ridge, NJ **June 2019 – Jan 2023**

- Provided one-on-one instruction in mathematics, including algebra, geometry, and calculus.
- Designed and implemented a JavaScript program to automate student attendance tracking.

PROJECTS

Queen's Data Analytics Hackathon **2023**

- Developed an autonomous AI-powered race car using reinforcement learning algorithms.
- Won 3rd place in hackathon competition.

Queen's Formula SAE Team **2022**

- Spearheaded the design and manufacturing of a race car suspension and steering system, reducing its weight by 3%.
- Employed Finite Element Analysis (FEA) alongside hands-on testing to refine the design through iterative evaluations.
- Expertise with technical drawings, tolerancing, and manufacturing parts with lathes, mills, and lasers.

SKILLS

- Development: JavaScript, C++, MATLAB, Python, Embedded Systems (Raspberry Pi and Arduino), Simulink, Git, Linux.
- Design: CAD modelling (SolidWorks), Finite Element Analysis, Eagle, Computer-Aided Manufacturing, 3D printing.