

Ritam Mukherjee

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🔗 <https://github.com/ritam-m-code>

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Experience

University of Waterloo

Sep 2025 – Present

Undergraduate Student Researcher

Waterloo, Ontario

- Working under Dr. Shirley Tang, I am working towards developing a 7 axis 3D Printer using a Gen3 motor arm. Researching and developing methods of non-planar slicing and g-code conversion, utilising Matlab, C++, Python, ROS, and various open source 3D slicers.

University of Waterloo

August 2024 – June 2025

Volunteer Student Researcher

Waterloo, Ontario

- Assisted Dr. Eugene Li at the WATiMAKE lab, contributing to an industrial project regarding the RUL of a CNC mill bit. Helped create a transformer model via Python using PyTorch, later implementing the data pipeline to collect data from physical sensors and present it to the model in CSV files.

Biotron Student Design Team

September 2025 – Present

Mechanical Team Member

Waterloo, Ontario

- Helping design a lower body exoskeleton to compete in the University of Michigan's ACE 2026 competition, working on the mechanical design of the hips and joints. Designing wire housing, motor joints and shaft connections using SolidWorks, working under various constraints such as weight, cost and material strength.

KW Sandbox

July 2023 – June 2025

President

Waterloo, Ontario

- Led a team of 12 high school students, together organizing and hosting free STEM themed workshops for 160+ local students. Worked with venues, sponsors and guest speakers, delivering workshops on AI Biotech, Webdesign, Blender and more.

2702 Rebels

July 2023 – November 2025

Team member

Waterloo, Ontario

- Competed in FIRST robotics, helping prototype, design and build the team robot. Worked primarily on the mechanical design of the disk launching mechanism, using SolidWorks and Fusion360. Also Worked on the computer vision module, using OpenCV, TensorFlow and Matlab.

Projects

1000 Elo Chessbot | <https://github.com/j3rry1iu/ChessHacks-Training> – Python, CNNs, Numpy, HuggingFace

- Built a chess engine using a ResNet style CNN, policy/value head, and a depth3 search to generate moves within 250ms.
- Used Modal cloud computing to train the model, uploading model weights and storing the model on HuggingFace.

RUL Predictor via Transformer model | <https://github.com/ritam-m-code/RUL-Transformer> – Python, ML, Transformers, PyTorch

- Helped implement a transformer model that took various sensor inputs and predicted the RUL of a CNC mill bit.
- Using torch, the model pulls data from CSV files and predicts future data, using numpy and Matplotlib to display the predicted data.

Axiom | <https://github.com/forkiron/axiom> – Node.js, TypeScript, Supabase, Vercel

- Built an AI platform to standardize Canadian school grades using test difficulty analysis, a 3D interactive school map, and a natural-language school agent
- Developed full-stack with Next.js, Gemini AI, Mapbox, and Supabase with crowd-sourced adjustment data persistence

Motion Activated Door Monitoring System | <https://github.com/ryanli222/smartdoorbell> – Raspberry Pi, OpenCV, Docker, Ngrok, FastAPI

- Developed a real-time motion detection system using OpenCV on a Raspberry Pi to monitor a webcam feed and detect door activity.
- On detection, activated a display, streamed live video, played alert audio, enabled two-way communication, and uploaded captured images to a FastAPI backend via Ngrok.

Technical Skills

Languages: Python, C++, C#, Processing

Technologies: SolidWorks, AutoCad, PyTorch, Numpy, Docker, Blender, Unity, N8N, OpenCV, Ngrok

Concepts: Mechanical Design, GD&T Controls, Recursion, CNNs, Transformers, Object Oriented Programming

Education

University of Waterloo

Expected May 2030

Bachelor of Applied Science in Mechatronics Engineering (GPA: 3.9/4.0)

Waterloo, Ontario

- Relevant Coursework:** Data Structures and Algorithms (C++), MTE 100 (Solidworks, AutoCAD, GD&T), Linear Algebra