Rishi Shah

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Education

McMaster University **Apr. 2029**
Engineering - Schulich Leader Scholar (1 of 50 in Canada to win $120K national STEM scholarship) *Hamilton, Ontario*

Experience

The Centre for Mechatronics and Hybrid Technologies **Oct. 2025 – Present**
Machine Learning Researcher *Hamilton, ON*
- Built hybrid LSTM model on top of PyBaMM SPMe simulations to predict anode potential, reducing RMSE from 8 mV to 1.24 mV
- Built hybrid SPMe–ML voltage-correction model improving SPMe RMSE from 56.5 mV to 2.6 mV

Western University **Apr. 2024 – Aug. 2025**
Machine Learning Researcher *London, ON*
- Developed a novel CORNet-S variant, a brain-inspired vision model, achieving 97.82% robustness against adversarial attacks while maintaining clean accuracy and lightweight architecture
- Benchmarked model robustness against ResNet-18 and AlexNet under PGD, CW, and patch attacks across MNIST, CIFAR-100, and ImageNet100 datasets

Hack49 Global **Jun. 2024 – Jun. 2025**
Co-founder *Remote*
- Built a global programming community of 950+ students across 40+ countries
- Secured $19,000+ in sponsorships by leading outreach, partnerships, and logistics

3D Forge **May 2024 – Sep. 2024**
Founder *London, ON*
- Launched 3D printing business for custom Croc accessories, delivering 100+ orders and generating $3500+ revenue
- Awarded Ontario's Summer Company Grant for student entrepreneurship

Robarts Research Institute **Nov. 2022 – May 2024**
Student Researcher *London, ON*
- Developed U-Net segmentation models for DICOM medical images
- Created manual segmentations to support AI training pipelines for surgical imaging
- Built AR visualization apps using Unity and Vuforia for real-time mobile medical applications

Projects

Adaptive Learning Robot | *C++, Arduino, Python, Cohere LLM* **Sept. 2025**
- Built a dual-system robot inspired by Kahneman's System 1 / System 2 model that learns new skills instantly from natural language without pre-training or rigid scripts
- Implemented Cohere LLMs with real-time search to convert messy instructions into smooth, executable motions for 2 custom 3-DOF robotic arms

From Pixels to Precision | *Python, MatLab — National Bronze; Divisional Gold; Sanofi BioGenius Award* **May 2023**
- Partnered with Synaptive Medical Inc. to develop a deep-learning model to track surgical tool movements in minimally invasive surgeries
- Trained on 300 manually segmented surgical images with 95% DICE accuracy
- Analyzed performance across 4 illumination and tool scenarios with sub-0.12s inference speed per image

Leadership & Extracurricular Activities

Payload Team Member **Oct. 2025 – Present**
McMaster Rocketry Team *Hamilton, ON*
- Building PCBs to design and test a self-healing polymer experiment on high-G rocket launches

DECA Chapter Lead **Sep. 2023 – Apr. 2024**
President *London, ON*
- Mentored 80+ students, and grew chapter by 55%, raising provincial qualifiers by 52% and international by 50%

Technical Skills

Languages: Python, C++, Java, C#, MATLAB
Frameworks & Libraries: PyTorch, Keras, OpenCV, Pandas, NumPy
Hardware & Tools: Arduino, Raspberry Pi, ESP32, KiCad, Git/GitHub, VS Code, Unity, Notion
3D Modeling & Design: Fusion 360, Blender, SketchUp, OnShape, Ultimaker Cura