

SARA PARVARESH RIZI

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Summary

Aspiring Electrical & Computer Engineer with experience in research and data analysis, currently serving as a Researcher at the UHN. Demonstrated ability to improve AI model accuracy for medical imaging and other applications. Eager to use my experience to drive data solutions and innovation.

Work Experience

Peter Munk Cardiac Center

AI Researcher

May 2026 - Present

Toronto General Hospital, UHN

- Conducted a scoping review for a LangGraph agentic AI system that analyzes longitudinal patient data in Epic via SMART on FHIR APIs, for pattern detection across multi-year cardiac records
- Developed a predictive ML model, combining DNNs and XGBoost to classify cardiac complication risk from telemetry data, enabling dynamic patient triage to monitored beds and decreasing wait times while improving unit throughput at Toronto General Hospital

AI in Medical Imaging Research

Research Assistant w/ Niloufar Delfan

May 2025 - Present

York University

- Developed a deep learning-based computer vision pipeline in PyTorch, using transfer learning with VGG16 and preprocessing techniques.
- Conducted systematic literature reviews using PubMed and Scopus to identify research gaps that informed the design of two new studies
- Co-authored a paper presented and published in the IEEE Engineering in Medicine and Biology Society (EMBC 2026), focused on deep learning methodologies and data analysis techniques in medical imaging.

KITE Research Institute

Research Volunteer for Smart4OSA / Canada LEADS Project

May 2026 - Present

UHN

- Quantified airway-opening response to neuromuscular electrical stimulation (NMES) by analyzing ultrasound imaging data, using signal-processing to extract muscle displacement metrics across experimental trials.
- Supported integration of wearable sensors into a closed-loop OSA diagnostic platform by combining textile electrodes, embedded sensing hardware, and real-time respiratory event detection

Green Technology Laboratory

Undergraduate Researcher

May 2025 - Aug 2025

University of Toronto

- Demonstrated a 3.8× improvement in solar-driven evaporation rate over untreated wood by synthesizing wood biochar monoliths and quantifying photo-thermal efficiency via FTIR and UV-Vis spectroscopy
- Won best podium presentation in Chemical & Materials Engineering at UofT UnERD 2025 to a panel of faculty judges across 50+ competing projects.
- Built data analysis pipeline in NumPy/Matplotlib for FTIR and UV-Vis spectroscopy measurements across 3 materials, cutting manual analysis time

Projects

Hospital Drone Logistics System [Link to Github](#)

University of Toronto Engineering Competitions (2nd place)

Jan 2026 - Jan 2026

University of Toronto

- Designed a multi-agent routing engine for hospital drone logistics, combining Weighted Dijkstra's with RRT (local collision avoidance) across a 3-lane priority-aware traffic system, implemented in Python/Flask with Three.js visualization.
- Benchmarked system throughput and efficiency across 500 simulated delivery cycles, quantifying 34% reduction in energy-per-delivery vs. baseline transport - tied for first at UTEK 2026.
- **Skills:** Python, JavaScript, HTML, CSS, Three.js, Flask, RRT Path Planning

Forecasting Glioblastoma Tumour Growth with Neural and Stochastic DEs [Link to Paper](#)

University of Toronto

Sep 2025 - Dec 2025

- Engineered a time-dependent Stochastic Differential Equation (SDE) using a modified Gompertz framework to simulate tumor proliferation and chemotherapy decay.
- Automated tumour extraction from the LUMIERE MRI dataset by deploying the hd-glio-auto U-Net segmentation model, feeding extracted time-series volumes into the HybridStateODE for stage-progression prediction via Markov transition matrices.
- **Skills:** Python (NumPy, SciPy, Matplotlib), Neural ODEs, PyTorch (torchsde), Ordinary/Partial Differential Equations, Markov Chains, Git/GitHub, LaTeX, Medical Image Segmentation (U-Net)

Leadership in Technical Communities

Engineering Science Education Conference (ESEC) - 300+ attendees, 8 industry speakers

Director of Communications (2025-26), Co-Chair (2026-27)

May 2025 - Present

Canadian Undergraduate Conference in AI (CUCAI) - 400+ attendees, 10+ industry representatives, 25+ universities

Marketing Director (2025-26), Co-Chair (2026-27)

May 2025 - Present

Undergraduate Engineering Research Day (UnERD)

Co-Chair (2026)

Mar 2026 - Aug 2026

- UofT's flagship undergraduate research showcase; ~300 engineering students, 100+ judges, 10+ industry representatives

Guided Engineering Academic Review Sessions (GEARS)

Academic Tutor at UofT (engineering math, linear algebra, physics, chemistry)

Sep 2025 - Apr 2026

Education

BASc in Engineering Science (Electrical & Computer) + PEY Co-op

University of Toronto

Sep 2024 - Jun 2029

Toronto, ON, Canada

- **GPA:** 4.0
- **Achievements:** Fessendon-Trott Scholarship, Dean's Merit Award, Paul Cadario Social Impact Internships In Engineering Award, Dean's List x4
- **Coursework:** C, Python, VHDL, Assembly, System Verilog, Computer Architecture, Data Structures and Algorithms, Probability and Statistics

Skills

- Communication, Research, Design, Project Management, CAD, Python, PyTorch, JavaScript, C, Assembly, System Verilog, Figma, Microsoft Suite, Gatsby, Agentic AI, C++, React, Deep Learning, Flask