

# Minahil Bakhtawar

Email | Webpage | LinkedIn | Github | Google Scholar

## EDUCATION

**BASc, Engineering Science, Machine Intelligence** University of Toronto

2021 — 2026

### Relevant Coursework:

- Deep Learning & Neural Networks (A-)
- Intro to Machine Learning (A-)
- Systems Software (A)
- Foundations of Computing (A-)
- Eng. Mathematics & Computation (A)
- Ordinary Differential Equations (A-)
- Probability & Statistics (A-)
- Computer Vision for Robo. (Ongoing)
- Optimization in ML. (Ongoing)

## RESEARCH INTERESTS

Responsible AI

Bias mitigation

Model auditing and evaluation

AI Fairness

Security, privacy, and adversarial robustness in ML systems

Human-Centered AI

## PUBLICATIONS

### 1. [ICCC'25] Detecting Amusing Games in Wordle [Arxiv]

Ronaldo L.<sup>†</sup>, Gary L.<sup>†</sup>, Cindy L., Adam K.<sup>†</sup>, **Minahil B.**<sup>†</sup>, Michael G.

<sup>†</sup>Equal contribution.

### 2. [IEEE CIBCB'22] The Impact of Preprocessing on the Automated Scoring of the USMLE Step 2 Clinical Skills Exam [IEEE CIBCB]

Yi Fei Lu, Nupur S., **Minahil B.**, Sneha B., Thanyathorn T., Jonathan C.

## REFERENCES

Shion Guha

Alan Chong

Michael Guerzhoy

Assistant Professor, University of Toronto

Associate Director, ISTEP, University of Toronto

Assistant Professor, University of Toronto

## RESEARCH EXPERIENCE

### Research Assistant

ISTEP, University of Toronto (Supervisor: Prof. Alan Chong)

Sept 2025 – Present

Toronto, Ontario

- Conducting research on responsible integration of **generative AI** into engineering communication education, focusing on equity, pedagogy, and student learning outcomes.
- Designed an independent research agenda after a comprehensive literature review of **100+ peer-reviewed sources**, proposing developing frameworks that increase transparency of AI-assisted writing support and improve student performance.

### Undergraduate Thesis Research

Faculty of Information, University of Toronto (Supervisor: Prof. Shion Guha)

Sept 2025 – Present

Toronto, Ontario

- Audited deployed population-level **diabetes prediction models** used in Ontario healthcare settings by analyzing **14M+ patient records**, identifying up to **18% performance disparity** across immigrant demographic subgroups (**CIFAR-funded**).
- Developing new machine learning approaches with **XGBoost** for **bias mitigation**, enhancing accountability and fairness in public-sector predictive systems.

### Research Student

University of Toronto (Supervisor: Prof. Michael Guerzhoy)

May 2025 – Sept 2025

Toronto, Ontario

- Investigated how **large language models** judge creativity in chess and Wordle gameplay by comparing perceived brilliance scores with **n-step entropy-based game-tree heuristics**.
- Designed experimental methodology, produced a dataset of reddit player reactions, and analyzed **model-human alignment** trends to quantify LLM perception of amusement.

### Research Assistant

National University Singapore (Supervisor: Prof. Tang Kok Zuea)

May 2025 – July 2025

Singapore

- Developed navigation algorithms for autonomous mobile robots in constrained indoor environments, achieving a **22% reduction in collision risk** during simulated deployments.
- Built and tested a protocol integrating mobile robots with **legacy elevator control systems**, enabling reliable multi-floor navigation with **>95% task completion rate** in prototype trials.

Research Assistant

ESROP Global,King Mongkut's University of Technology Thonburi & UofT (Supervisor: Prof. Jonathan Chan)

May 2022 – Sept 2022

Toronto, Ontario

- Conducted literature review on NLP techniques for domain-specific medical assessment tasks, focusing on automated grading of USMLE-style written responses.
- Implemented a benchmarking pipeline to evaluate model performance across pre-processing strategies (normalization, feature scaling, token-level filtering).
- Developed early-stage designs for an AI-assisted tool to support elderly care including requirement developing and and UX workflow planning.

INDUSTRY EXPERIENCE

ML Engineering Intern

Magna Electronics

May 2024 – May 2025

Toronto, Ontario

- Developed, benchmarked, and fine-tuned computer vision models for autonomous driving applications, including perception and scene understanding pipelines.
- Built end-to-end ML workflows for parking detection models.
- optimized model performance, and supported integration of vision models into production-oriented autonomous driving systems.

AWARDS & HONOURS

Summer Research Exchange Program (SREP Award), \$3,000	05 2025
Undergraduate research award, received for independent research abroad at National University of Singapore	
International Experience (IE+ Award), \$1,500	05 2025
Institutional research funding awarded by the Center for International Experience, University of Toronto	
Engineering Science Research Opportunity Program (ESROP UofT) Award, \$7,500	05 2023
Department-wide undergraduate research award, received for research with the Department of Physics	
Engineering Science Research Opportunity Program (ESROP Global) Award, \$3,500	05 2022
Department-wide undergraduate research award, received for collaborative research with KMUTT (king Mongkutt University of Technology Thonburi, Thailand)	
University of Toronto International Scholars Award, \$100,000	09 2021
Engineering merit scholarship awarded to top international undergraduate students from a pool of 12,000 applicants	
Dean's Honours List	2021 – 2024
Recognized for academic excellence across multiple years in the Faculty of Applied Science and Engineering	

SERVICES & LEADERSHIP

Electrical Team Lead, University of Toronto Supermileage	05 2023 – 05 2024
Led research and design of energy-efficient circuits for the autonomous car, enabling competitive performance at the annual Shell Eco-Marathon.	
Quantisation Lead, University of Toronto Autonomous Drone Racing League (UTADR)	05 2023 – 04 2024
Optimized and quantized ML models for autonomous drone perception and navigation, significantly improving inference speed and real-time performance. Competed in the world's largest autonomous drone racing league.	
Quantisation Lead, University of Toronto Formula SAE Team	05 2022 – 05 2023
Accelerated computer vision model inference for Canada's first FSAE autonomous car, maintaining accuracy while reducing latency for real-time control.	