Minahil Bakhtawar

Email | Webpage | Linkedin | Github | Google Scholar

EDUCATION

BASc, Engineering Science, Machine Intelligence *University of Toronto (GPA: 3.46/4.00)*   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.[†], Gary L.[†], Cindy L., Adam K.[†], *Minahil B.*[†], Michael G.
   [†]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	Assistant Professor, University of Toronto
Alan Chong	Associate Director, ISTEP, University of Toronto
Michael Guerzhoy	Assistant Professor, University of Toronto

RESEARCH EXPERIENCE

Research Assistant   **Sept 2025 – Present**
ISTEP, University of Toronto (Supervisor: Prof. Alan Chong)   *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   **Sept 2025 – Present**
Faculty of Information, University of Toronto (Supervisor: Prof. Shion Guha)   *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   **May 2025 – Sept 2025**
University of Toronto (Supervisor: Prof. Michael Guerzhoy)   *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   **May 2025 – July 2025**
National University Singapore (Supervisor: Prof. Tang Kok Zuea)   *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   **May 2022 – Sept 2022**
ESROP Global,King Mongkut's University of Technology Thonburi & UofT (Supervisor: Prof. Jonathan Chan)   *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   **May 2024 – May 2025**
Magna Electronics   *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.