UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE & ENGINEERING

Undergraduate Student Research Opportunities – 2025

To assist undergraduate students in finding faculty supervisors for summer research, the following Engineering faculty have submitted their research positions available for undergraduate students. **Please note that this is not an exhaustive list.** Please contact faculty members directly to inquire as to their availability to support undergraduate summer research students.

An asterisk (*) following the name of a professor indicates that they are interested in supporting a faculty-student matching process for the NSERC Black and Indigenous USRAs.

Professor Name	**Arthur Chan***
Number of Undergraduate Positions Available for Summer 2025	1-2
Department/Division	Chemical Engineering & Applied Chemistry (ChemE)
Name of Research Area/Lab	Environmental Chemistry
Description of Lab	We study atmospheric particles, including their sources, reactions and impacts on climate and human health. More information can be found on our website: https://chem-eng.utoronto.ca/faculty-staff/faculty-members/arthur-chan/
Research Location	On-Site
How to Apply	Email directly (arthurwh.chan@utoronto.ca) with the following items: • Unofficial Transcript • Cover Letter
Deadline to Apply	**February 1, 2025**
Additional Comments	Lived experiences with air pollution impacts (e.g. living near major pollution sources, in densely populated urban centers) may be an asset for air quality research. We strongly encourage students who are disproportionately impacted by air pollution to apply.

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Professor Name	**Charles Jia***
Number of Undergraduate Positions Available for Summer 2025	4
Department/Division	Chemical Engineering & Applied Chemistry (ChemE)
Name of Research Area/Lab	Green Technology Lab
Description of Lab	More information can be found on our website: https://chem-eng.utoronto.ca/faculty-staff/faculty-members/charles-q-jia/
Research Location	On-Site
How to Apply	Email directly (cq.jia@utoronto.ca) with the following items: • Unofficial Transcript • Cover Letter • Resume
Deadline to Apply	**February 28, 2025**
Additional Comments	N/A

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Professor Name	**Greg Evans***
Number of Undergraduate Positions Available for Summer 2025	1-2
Department/Division	Chemical Engineering & Applied Chemistry (ChemE)
Name of Research Area/Lab	Air Quality and Climate
Description of Lab	SOCAAR is an interdisciplinary centre for the study of air quality, with a focus on how pollutants impact human health and the environment. SOCAAR brings together medical personnel, atmospheric chemists and environmental engineers, and promotes collaborative research through access to state-of-the-art facilities and partnerships with government and industry. (https://www.socaar.utoronto.ca/) Students will support a study of the contributions on non-tailpipe emissions from vehicle brakes, tires and road dust, to air quality in Toronto. Specifically, the students will support the, collection, analysis and interpretation of air quality samples collected at 'hot spot' sites across Toronto by: • Weighing filters • Evaluating chemical composition using Xray fluorescence • Evaluating instrument performance and resolving any issues identified • Support pre-campaign deployment and execution of sample collection campaign • Compiling data and creating appropriate visualizations • Preparing and delivering presentations based on their research • Documenting their research in a final report
Research Location	On-Site
How to Apply	Email directly (greg.evans@utoronto.ca) with the following items: • Unofficial Transcript • Resume
Deadline to Apply	**March 1, 2025**
Additional Comments	N/A

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Professor Name	**Donald Kirk**
Number of Undergraduate Positions Available for Summer 2025	2
Department/Division	Chemical Engineering & Applied Chemistry (ChemE)
Name of Research Area/Lab	Interfacial electrochemistry and carbon sequestration
Description of Lab	Project 1 Researching the behaviour of electrical charge storage in capacitors Project 2 Conversion of waste plastics to value added biochar
Research Location	On-Site
How to Apply	Email directly (don.kirk@utoronto.ca) with the following items: • Unofficial Transcript • Resume
Deadline to Apply	**May 1, 2025**
Additional Comments	N/A

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Professor Name	**Mohamad Moosavi***
Number of Undergraduate Positions Available for Summer 2025	2-3
Department/Division	Chemical Engineering & Applied Chemistry (ChemE)
Name of Research Area/Lab	Artificial Intelligence for Chemical Science
Description of Lab	AI for accelerated materials discovery applied to sustainability applications, such as battery thermal cooling and carbon capture.
Research Location	On-Site
How to Apply	Email directly (mohamad.moosavi@utoronto.ca) with the following items: • Cover Letter • Resume
Deadline to Apply	**February 28, 2025**
Additional Comments	Students should demonstrate interest in programming, mathematical modelling, and AI.

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Professor Name	**Mansoor Barati Sedeh**
Number of Undergraduate Positions Available for Summer 2025	1
Department/Division	Materials Science & Engineering (MSE)
Name of Research Area/Lab	Sustainable Materials Processing Research Group
Description of Lab	More information can be found on our website: https://mse.utoronto.ca/faculty-staff/professors/barati/
Research Location	On-Site
How to Apply	Email directly (mansoor.barati@utoronto.ca) with the following items: • Unofficial Transcript • Resume
Deadline to Apply	**January 31, 2025**
Additional Comments	N/A

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Professor Name	**Rana Ahmed Barghout***
Number of Undergraduate Positions Available for Summer 2025	2
Department/Division	Chemical Engineering & Applied Chemistry (ChemE)
Name of Research Area/Lab	Laboratory for Metabolic Systems Engineering
Description of Lab	More information can be found on our website: https://lmse.utoronto.ca/
Research Location	Hybrid
How to Apply	Email directly (rana.barghout@mail.utoronto.ca) with the following items: • Unofficial Transcript • Cover Letter • Resume
Deadline to Apply	**March 1, 2025**
Additional Comments	N/A

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Professor Name	**Caitlin Maikawa***
Number of Undergraduate Positions Available for Summer 2025	2-3
Department/Division	Institute of Biomedical Engineering (BME)
Name of Research Area/Lab	Maikawa Lab - Biointerfacing Materials
Description of Lab	Our group develops dynamic polymer materials for drug delivery and biosensing applications. We are interested in understanding how a material's chemical properties influence its functional performance in the body. One example of this, is understanding the chemical and physical properties of microgels important for mucoadhesion to inflamed sites of the intestine. It is well established that mucoadhesion to healthy mucous is dependent on a number of factors including hydrogen bonding, charge, surface roughness, and several others. However, it is not clear how these factors change in the inflamed microenvironment. We aim to test a range of chemistries to better understand the critical factors for mucoadhesion to inflamed sites. The project we are recruiting for would focus on engineering and testing tools that can be used for automated microgel fabrication to enable high-throughput synthesis and testing of a large microgel library. Skills that would be helpful for this position include: familiarity with CAD software, basic programming skills, and strong problem solving skills.
Research Location	On-Site
How to Apply	Email directly (caitlin.maikawa@mail.utoronto.ca) with the following items: • Cover Letter • Resume
Deadline to Apply	**February 5, 2025**
Additional Comments	N/A

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Professor Name	**Kei Masani**
Number of Undergraduate Positions Available for Summer 2025	1
Department/Division	Institute of Biomedical Engineering (BME)
Name of Research Area/Lab	Rehabilitation Engineering, Human Biomechanics, Human Neurophysiology
Description of Lab	Our research aims to improve the mobility of people who experience neurological impairment. Our approach to investigating human movement is undertaken from a neuromechanical perspective, i.e. the union of neurophysiology and physics. We focus specifically on developing accurate assessments and therapeutic tools using functional electrical stimulation for standing, walking and adapted exercise. https://www.masl.ca
Research Location	Hybrid
How to Apply	Email directly (k.masani@utoronto.ca) with the following items: • Unofficial Transcript • Resume
Deadline to Apply	**March 1, 2025**
Additional Comments	N/A

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Professor Name	**Kevin Golovin***
Number of Undergraduate Positions Available for Summer 2025	2
Department/Division	Mechanical & Industrial Engineering (MIE)
Name of Research Area/Lab	Durable Repellent Engineered Advanced Materials (DREAM) Lab
Description of Lab	The DREAM Lab explores novel coatings, surface interactions, and surface modification strategies to make positive impacts on the world. There are several projects open to undergraduates this year. One project involves the use of robotics in the development of anti-fingerprint coatings for smartphone screens. Another project involves exploring coatings for fabrics to minimize or eliminate the release of microplastic fibres during laundering. A third project is investigating how oils can be chemically attached to surfaces, and how the chemistry of the surface affects the amount of oil and the resultant liquid repellency. Typically the number of available spots is limited to students who have secured a fellowship supporting their summer research, such as those from UTEA, NSERC, CPE, or the MIE Department.
Research Location	On-Site
How to Apply	Email directly (kevin.golovin@utoronto.ca) with the following items: • Unofficial Transcript • Cover Letter • Resume
Deadline to Apply	**March 31, 2025**
Additional Comments	N/A

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Professor Name	**Trevor Carey***
Number of Undergraduate Positions Available for Summer 2025	1
Department/Division	Civil & Mineral Engineering (CivMin)
Name of Research Area/Lab	Geotechnical Earthquake Engineering
Description of Lab	Engaged in a combination of in-person lab work and computer-based tasks. Laboratory work involved preparing soil samples for engineering tests simulating earthquake loading. Computer work focused on processing high-speed camera images to track displacements during soil liquefaction caused by earthquake loading. Gained skills in Python scripting, geotechnical laboratory operations and testing procedures, and an understanding of the research process.
Research Location	Hybrid
How to Apply	Email directly (trevor.carey@utoronto.ca) with the following items: • Unofficial Transcript • Resume
Deadline to Apply	**May 1, 2025**
Additional Comments	N/A

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Professor Name	**Ali Dolatabadi***
Number of Undergraduate Positions Available for Summer 2025	2
Department/Division	Mechanical & Industrial Engineering (MIE)
Name of Research Area/Lab	Mind Lab
Description of Lab	Mind Lab: https://dolatabadi.mie.utoronto.ca
Research Location	On-Site
How to Apply	Email directly (ali.dolatabadi@utoronto.ca) with the following items: • Unofficial Transcript • Cover Letter • Resume
Deadline to Apply	**May 1, 2025**
Additional Comments	Minimum GPA Requirement: 3.3

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Professor Name	**Weilai Yu***
Number of Undergraduate Positions Available for Summer 2025	1-2
Department/Division	Chemical Engineering & Applied Chemistry (ChemE)
Name of Research Area/Lab	LOGICS for Energy: https://www.logics-utoronto.org/
Description of Lab	Dr. Yu's research program at UofToronto will integrate fundamental electrochemistry, surface science, and functional material-interface design to innovate next-generation technologies for sustainable chemical and energy conversion. Researchers will work on projects that push the boundaries of current knowledge in the following areas: Interphase Optimization of Next-Generation Battery Materials: Developing stable and high-performance solid-electrolyte interphases (SEI) and cathode-electrolyte interphases (CEI) for next-generation batteries. Electrocatalytic Molecular Manufacturing for Circular Economy: Exploring new electrocatalytic processes for sustainable and efficient chemical manufacturing that supports a circular economy. Solar-driven Chemical Reforming for Environmental Sustainability: Utilizing solar energy to drive chemical reforming processes aimed at achieving environmental sustainability through clean energy. High-throughput and Autonomous Experimentation Accelerated by AI: Harnessing AI-driven autonomous experimentation platforms to rapidly discover and optimize new materials, dramatically reducing the time required for innovation.
Research Location	Hybrid
How to Apply	Email directly (weilai.yu@utoronto.ca) with the following items: • Unofficial Transcript • Cover Letter • Resume
Deadline to Apply	**March 31, 2025**
Additional Comments	N/A

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Professor Name	**Chi-Guhn Lee**
Number of Undergraduate Positions Available for Summer 2025	3
Department/Division	Mechanical & Industrial Engineering (MIE)
Name of Research Area/Lab	DoRL
Description of Lab	We do research in a wide range of machine learning and reinforcement learning and apply the tools to supply chain, manufacturing, and others.
Research Location	Hybrid
How to Apply	Email directly (chiguhn.lee@utoronto.ca) with the following items: • Unofficial Transcript • Cover Letter • Resume
Deadline to Apply	**March 31, 2025**
Additional Comments	Minimum GPA Requirement: 3.3

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Professor Name	**Enid Montague***
Number of Undergraduate Positions Available for Summer 2025	3
Department/Division	Mechanical & Industrial Engineering (MIE)
Name of Research Area/Lab	Healthcare Engineering
Description of Lab	Human subjects studies to explore automation in automation, caregiving and cardiac care. Studies involve design, evaluation and observational research.
Research Location	Hybrid
How to Apply	Email directly (enid.montague@utoronto.ca) with the following items: • Unofficial Transcript • Resume
Deadline to Apply	**March 1, 2025**
Additional Comments	N/A

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Professor Name	**Axel Guenther***
Number of Undergraduate Positions Available for Summer 2025	3
Department/Division	Engineering Science (EngSci)
Name of Research Area/Lab	Guenther Research Group
Description of Lab	Microfluidic device innovations for applications in the materials and life sciences. Organized soft materials, blood vessels on chips, biofabrication, and bioprinting. https://guentherlab.mie.utoronto.ca
Research Location	On-Site
How to Apply	Email directly (axel.guenther@utoronto.ca) with the following items: • Unofficial Transcript • Cover Letter • Resume
Deadline to Apply	**February 15, 2025**
Additional Comments	N/A

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Professor Name	**Birsen Donmez Akyildiz***
Number of Undergraduate Positions Available for Summer 2025	4
Department/Division	Mechanical & Industrial Engineering (MIE)
Name of Research Area/Lab	Human Factors and Applied Statistics Lab
Description of Lab	The HFASt Lab conducts research on understanding and improving human behaviour and performance in multi-task and complex situations using various analytical techniques. Projects this summer will include surveying the most up-to-date driving automation systems, testing the effectiveness of driver drowsiness interventions, testing the effectiveness of truck driver training programs, piloting driver visual scan behaviour studies, developing interventions to change risky driving behaviours among fleet drivers, etc. Research students will work on tasks such as reviewing car owner's manuals, recruiting experiment participants, conducting experiments on the driving simulator and collecting data, processing and analyzing collected data, reviewing archival data, helping with data collection through interviews and surveys, etc.
Research Location	Hybrid
How to Apply	Email directly (birsen.donmez@utoronto.ca) with the following items: • Unofficial Transcript • Cover Letter • Resume
Deadline to Apply	**February 10, 2025**
Additional Comments	N/A

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Professor Name	**Cristina Amon, alongside Dr. Carlos Da Silva and Dr. Dipali Nayak***
Undergraduate Positions Available for Summer 2025	1
Department/Division	Mechanical & Industrial Engineering (MIE)
Name of Research Area/Lab	Atoms Laboratory https://atoms.mie.utoronto.ca/ Research Areas: EV thermal management system, lattice thermal conductivity, machine learning.
Description of Project	*Title: Machine-learning-derived thermal conductivity of novel materials for electrodes in EV batteries* Electric vehicle (EV) batteries have demonstrated optimal performance within a temperature range of 15 to 35°C. However, during operation, the issue of overheating remains a significant challenge, leading to reduced battery performance and the risk of thermal runaway. As a result, thermal conductivity becomes a crucial parameter in the battery thermal management system (BTMS). Experimental thermal conductivity measurement is costly and time-consuming, while theoretical tools offer a valuable alternative for understanding the lattice thermal conductivity of novel electrode materials used in metal-ion batteries. Typically, thermal conductivity is calculated by solving the Boltzmann Transport Equation (BTE) using density functional theory (DFT), a computationally intensive process. To address these challenges, a machine learning approach can be adopted to predict the lattice thermal conductivity of materials. This approach offers a more efficient and cost-effective method for evaluating materials, ultimately enhancing the design and performance of EV BTMS. This project aims to: • explore machine learning approaches to calculate the lattice thermal conductivity of novel materials • understand the relationship between thermal conductivity and harmonic and anharmonic properties of materials
Research Location	On Site
How to Apply	Email directly (cristina.amon@utoronto.ca) with the following items, in a single PDF: • Unofficial Transcript • CV • Single Paragraph describing your interest in the project
Deadline to Apply	**Open until filled**
Additional Comments	Applicants should have a background knowledge of heat transfer, python, and machine learning.

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Professor Name	**Daman Panesar***
Number of Undergraduate Positions Available for Summer 2025	2
Department/Division	Civil & Mineral Engineering (CivMin)
Name of Research Area/Lab	Concrete materials - durability and sustainability climate effects on infrastructure, code provisions for low carbon,
Description of Lab	More information can be found on our website: https://civmin.utoronto.ca/home/about-us/directory/professors/daman-panesar/
Research Location	On-site
How to Apply	Email directly (d.panesar@utoronto.ca) with the following items: • Unofficial Transcript • Cover Letter • Resume
Deadline to Apply	**March 7, 2025**
Additional Comments	N/A

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Professor Name	**R. Douglas Hooton**
Number of Undergraduate Positions Available for Summer 2025	1-2
Department/Division	Civil & Mineral Engineering (CivMin)
Name of Research Area/Lab	Innovative Sustainable Concrete Materials
Description of Lab	We are working on several new, innovative and low-carbon cementitious materials intended for use in concrete. Also developing new CSA and ASTM standard test methods for assessing their performance. The Student will work in the Concrete Materials Laboratories with Prof. Hooton and post-doc Dr. Soley Einarsdottir and assist in the assessment of some of these new materials, and in development of the new test methods.
Research Location	On-site
How to Apply	Email directly (d.hooton@utoronto.ca) with the following items: • Unofficial Transcript • Resume
Deadline to Apply	**February 25, 2025**
Additional Comments	Minimum GPA Requirement: 3.2

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Professor Name	**Oh-Sung Kwon**
Number of Undergraduate Positions Available for Summer 2025	3
Department/Division	Civil & Mineral Engineering (CivMin)
Name of Research Area/Lab	Structural Engineering
Description of Lab	Ph.D. students in my group will be conducting experiments in the Structural Testing Facilities this summer. These experiments will involve fabricating structural testing specimens, instrumentation, testing, and post-processing of test results. Undergraduate students recruited for summer positions will have two primary roles: 1. Assisting graduate students with laboratory research as needed. 2. Conducting independent research related to structural engineering when lab activities are not scheduled. This summer research position offers a valuable opportunity to gain familiarity with structural engineering, develop hands-on skills in the lab, and enhance teamwork abilities. For research projects and publications from my group, please visit the following link. https://kwon.civmin.utoronto.ca/
Research Location	On-site
How to Apply	Email directly (os.kwon@utoronto.ca) with the following items: • Unofficial Transcript • Cover Letter • Resume
Deadline to Apply	**February 16, 2025**
Additional Comments	N/A

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Professor Name	**Ravi Adve***
Number of Undergraduate Positions Available for Summer 2025	2
Department/Division	Electrical & Computer Engineering (ECE)
Name of Research Area/Lab	…
Description of Lab	We are interested in investigating multiple questions in new wireless network architectures. Students interested in communications (broadly), applications of machine learning in wireless comm., the intersection of wireless comm. and signal processing should email me at rsadve@ece.utoronto.ca
Research Location	On-site
How to Apply	Email directly (raviraj.adve@utoronto.ca) with the following items: • Unofficial Transcript • Statement of Interest • Resume
Deadline to Apply	**February 28, 2025**
Additional Comments	N/A

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Professor Name	**Minghan Xu***
Number of Undergraduate Positions Available for Summer 2025	2
Department/Division	Civil & Mineral Engineering (CivMin)
Name of Research Area/Lab	Mine Energy Lab
Description of Lab	*Project 1: Develop an electrification framework towards sustainable mining in the North* The mining industry relies heavily on fossil fuels to meet its high energy demands for electric, motive, and thermal power. Although Canada has one of the cleanest electricity grids, many mines remain carbon-dependent due to limited access to the grid in remote areas of Northern Canada, and renewable alternatives are often prohibitively expensive. Hence, there is a great demand for a system-level mine electrification framework that hybridizes renewable energy sources, utilizes the unique characteristics of each mine site, and optimizes the economic and environmental benefits. This project enables mines to transition from fossil fuels to renewable energy sources. Specifically, it includes two parts: (i) the quantification and analysis of mine energy supply and site-specific conditions and (ii) the development of an electrification framework with renewable energy generation and storage systems. The mine electrification framework will integrate electrochemical and thermal energy storage to maintain a consistent power supply, even when renewable generation is intermittent. It provides a pathway for sustainable mining practices that contribute to Canada's Net-Zero target by 2050. Students are expected to assist the development of novel mine electrification frameworks, implement them into commercially available mine design software, and present findings through academic reports. *Project 2: Renewable heating and cooling in northern mines* Heating and cooling account for almost half of the total energy costs in northern mines in Canada. In underground mines, heating is essential to prevent shaft freezing and ensure mine safety during winter. In deep mines, cooling is required when working temperatures rise due to rock temperature and auto-compression effects. Traditional heating and cooling methods, such as burning propane, natural gas, or using diesel engines, contribute significantly to carbon emissions and are subject to provincial carbon taxes.

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	Spray freezing (SF) technology, a novel renewable energy solution, has proved to be a viable alternative to fossil fuels for meeting the heating and cooling demands of mines in sub-arctic climates. This technology utilizes the latent heat of water solidification to heat air by injecting water droplets into a subarctic airflow. The heat transfer raises air temperature and freezes the droplets, forming ice packs that, when properly stacked, can serve as potential cooling sources. This project includes the innovation and implementation of SF technology for mine heating and cooling to mitigate the effect of climate change. Students are expected to assist the development of a new modeling framework, compare it with existing or experimental data, and present findings through academic reports.
Research Location	On-site
How to Apply	Email directly (minghan.xu@utoronto.ca) with the following items: • Unofficial Transcript • Resume
Deadline to Apply	**March 31, 2025**
Additional Comments	Minimum GPA Requirement: 3.5 Interested applicants should email minghan.xu@utoronto.ca with the subject line: Join Mine Energy Lab – [Your Full Name]

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Professor Name	**Yunshun Zhong**
Number of Undergraduate Positions Available for Summer 2025	2
Department/Division	Civil & Mineral Engineering (CivMin)
Name of Research Area/Lab	Centre for Information Systems in Infrastructure & Construction (i2c)
Description of Lab	We are seeking a talented student with experience in front-end development and UI/UX design to create a graphical user interface (GUI) for the AI-based shoreline recognition system. The GUI will allow TRCA staff to upload orthophotos, apply the trained machine learning model, and visualize the results in an intuitive and interactive manner. **Key Responsibilities** 1. Interface Development: Design and implement a web-based or desktop application to enable users to run the machine learning model and visualize outputs. 2. User Experience: Ensure the interface is intuitive, user-friendly, and accessible for non-technical users at TRCA. 3. Integration: Connect the GUI with the machine learning backend, ensuring smooth data flow and model execution. 4. Visualization: Develop tools for rendering channel bank delineations on aerial images, including overlays and interactive map features. Performance Optimization: Ensure the system is efficient, responsive, and capable of handling large images. **Qualifications for Both Roles:** Currently enrolled in or a recent graduate of a Bachelor's or Master's program in Computer Science, Software Engineering, Geomatics, or a related field. **Timeline** The expected timeframe to complete this project is 3 months from the time of commencement. Project start date would preferably in the summer of 2025.
Research Location	Hybrid
How to Apply	Email directly (yunshun.zhong@mail.utoronto.ca) with the following items: • Unofficial Transcript • Cover Letter • Resume
Deadline to Apply	**April 15, 2025**
Additional Comments	Minimum GPA Requirement: 3.0

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Professor Name	**Shurui Zhou***
Number of Undergraduate Positions Available for Summer 2025	1-2
Department/Division	Electrical & Computer Engineering (ECE)
Name of Research Area/Lab	FORCOLAB – Augmentation of Version Control in CAD
Description of Lab	**Project Description:** For many years, version control has been a crucial tool in supporting software development. The concept has now extended to other fields of application, such as computer-aided design (CAD). CAD is an essential tool in mechanical engineering, allowing users to model the geometric details of products before manufacturing. However, the capabilities of version control in CAD remain rudimentary, leaving research gaps for improvement. Since modern CAD software handles data with complex hierarchies and dependencies, directly mirroring the version control system from software engineering is not feasible. This project explores innovative ways of analyzing and presenting the unique data structure of CAD models, which can be retrieved from commercially available CAD software through API integration. Then, tools can be developed for CAD users to improve state-of-the-art version control capability in modern CAD. User studies will be conducted after tool development to evaluate its effectiveness. As an undergraduate research assistant, you will gain hands-on experience in research design, software tool development, and paper writing, with the potential to co-author a top-tier conference paper.
Research Location	Hybrid
How to Apply	Email directly (shurui.zhou@utoronto.ca) with the following items: • Unofficial Transcript • CV • GitHub account ***NOTE:*** Please copy Kathy Cheng (kathy.cheng@mail.utoronto.ca) and Felix Deng (yuanzhe.deng@mail.utoronto.ca) on your email.
Deadline to Apply	**March 31, 2025**
Additional Comments	Skills Requirement: • Strong background in user interface design (HTML/CSS/JavaScript). • Proficiency in Python programming. • Creativity and passion for data visualization and human-computer interaction (HCI) research. • Familiarity with CAD software and experience using APIs for commercial software will be a significant advantage.

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Professor Name	**Ashvin Goel**
Number of Undergraduate Positions Available for Summer 2025	1
Department/Division	Electrical & Computer Engineering (ECE)
Name of Research Area/Lab	Software Systems
Description of Lab	*Project: Hybrid Transaction and Analytical Processing on Dynamics Graphs* This research focuses on designing a hybrid graph processing system that supports both transaction and analytical processing workloads. Our aim is to build a highly scalable system that can support millions of transactional updates per second, while handling a rich set of analytical graph queries efficiently. Graph processing on dynamic graphs (graphs that change over time) is important for many applications such as recommender systems and fraud detection. These services perform graph queries on large and rapidly changing graphs. For example, Alibaba uses a combination of graph analytics and interactive graph traversals for fraud detection and the Twitter/X recommendation service is based on graph pattern matching and graph traversals. These analyses are performed concurrently with transactions that update the graph, e.g., insert and delete edges, so that the queries access the most recent data. Building a hybrid graph system is challenging because transactional graph updates and graph queries have different requirements. Our research group is exploring various graph structure and concurrent execution designs that support both types of workloads efficiently. In this project, the student will start by evaluating the performance of our current graph processing system. Then, the student will explore design options that enable optimizing the system for specific workloads.
Research Location	On-site
How to Apply	Email directly (ashvin.goel@utoronto.camailto:birsen.donmez@utoronto.ca) with the following items: • Unofficial Transcript • Resume
Deadline to Apply	**February 24, 2025**
Additional Comments	Minimum GPA Requirement: 3.5

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Professor Name	**Mason Ghafghazi***
Number of Undergraduate Positions Available for Summer 2025	2
Department/Division	Civil & Mineral Engineering (CivMin)
Name of Research Area/Lab	Geotechnical Engineering
Description of Lab	We are looking for one or two motivated students to help us with an exciting, and ground-breaking research project in the Mechanics and Géotechnique Laboratory which is located in Galbraith building. The project involves performing larges-scale simulated ground experiments in a CPT calibration chamber. The idea behind the project is creating controlled and known conditions for soil, and then performing real-life field tests, to see how these test results are connected to the engineering properties of the soil. Correlations will then be developed which will be used by industry sponsors in practice. The work will include preparing samples, moving large quantities of soil into and out of the chamber, handling equipment using a crane, performing tests using automated control devices, data acquisition and processing, summarizing data and writing reports. This is a highly practical project which is being performed in close collaboration with industry partners. Previous research assistants have moved on to do their PEY with the partners and have a potential for a career in this highly specialized and exciting field. The position also provides an opportunity to be part of a dynamic, diverse, and fun research group and get exposure to various research activities. MG lab is committed to promoting diversity, so applicants of all backgrounds are strongly encouraged to apply. To apply please forward your resume, transcripts, and availability (part time-full time, start and end dates) to mason.ghafghazi@utoronto.ca
Research Location	On-site
How to Apply	Email directly (mason.ghafghazi@utoronto.ca) with the following items: • Unofficial Transcript • Resume
Deadline to Apply	**August 29, 2025**
Additional Comments	N/A

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Professor Name	**Elodie Passeport***
Number of Undergraduate Positions Available for Summer 2025	1
Department/Division	Civil & Mineral Engineering (CivMin)
Name of Research Area/Lab	Passeport Lab
Description of Lab	The student will help in our project aiming at better understanding the biodegradation and photodegradation of chloroanilines, chloronitrobenzenes, and selected pesticides. The work will mainly be in the lab but will also involve brief review and organization of the literature. The student will work in an amazing and fun team of researchers in the lab, and learn laboratory skills and the use of analytical instruments.
Research Location	On-site
How to Apply	Email directly (elodie.passeport@utoronto.ca) with the following items: • Unofficial Transcript • Cover Letter • Resume
Deadline to Apply	**March 16, 2025**
Additional Comments	N/A

UNIVERSITY OF TORONTO
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Professor Name	**Aryan Rezaei Rad***
Number of Undergraduate Positions Available for Summer 2025	2
Department/Division	Civil & Mineral Engineering (CivMin)
Name of Research Area/Lab	Timber Engineering, Structural Engineering, Algorithmic-Aided Design
Description of Lab	Project 1: Building on an existing database for connections in Cross-Laminated Timber shear walls, this project aims to expand the database by incorporating a new branch dedicated to storing quantitative and qualitative performance measures of wall components. These component records will be linked to the connection database, creating a more complex relational structure. The student will first receive training on the mechanics of CLT shear walls and the database structure. Subsequently, they will work with published experimental data on component-level performance to populate the database. Project 2: The project focuses on developing an open-access computational platform for simulation-based science in timber engineering. Using COMPAS and COMPAS FEA2, the project aims to integrate OpenSees, a widely used finite element analysis framework, within the COMPAS FEA2 ecosystem. This integration will enable real-time structural simulations of timber systems. The project will involve scripting in Python, API development, and testing of benchmark cases. The outcome will support researchers and engineers in conducting parametric, multi-scale simulations of timber structures. The final platform will be open-source, fostering collaboration and innovation in computational timber engineering. Faculty bio: https://civmin.utoronto.ca/home/about-us/directory/professors/aryan-rezaei-rad/ Lab info: https://sustrucsy.civmin.utoronto.ca/
Research Location	Hybrid
How to Apply	Email directly (aryan.rad@utoronto.ca) with the following items: • Unofficial Transcript • Cover Letter • Resume
Deadline to Apply	**March 24, 2025**
Additional Comments	Minimum GPA Requirement: 3.5

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Professor Name	**LH Shu**
Number of Undergraduate Positions Available for Summer 2025	1-2
Department/Division	Mechanical & Industrial Engineering (MIE)
Name of Research Area/Lab	Design Effectiveness Laboratory (DEL)
Description of Lab	More information can be found on our website: https://shulab.mie.utoronto.ca/
Research Location	On-site
How to Apply	Email directly (shu@mie.utoronto.ca) in a single PDF file with the following items: • Cover Letter outlining your research interest and related experience • Unofficial Transcript • Resume Please name this combined PDF file as follows: **FamilyName_GivenName_UGYear_DDMonYYYY.pdf**, where DDMonYYYY (e.g., 01Feb2025) is the date of your initial email correspondence.
Deadline to Apply	**February 28, 2025**
Additional Comments	N/A

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Professor Name	**Professor Cristina Amon, alongside Dr. Carlos Da Silva and Dr. Sidra Farid**
Number of Undergraduate Positions Available for Summer 2025	1
Department/Division	Mechanical & Industrial Engineering (MIE)
Name of Research Area/Lab	Battery Research and Knowledge Translation
Description of Lab	***Battery Research and Knowledge Translation with Canada's Northern and Indigenous Communities*** The University of Toronto Electrification Hub (https://electrification.utoronto.ca/), in collaboration with Yukon University Northern Energy Innovation (https://www.yukonu.ca/research/research-centre/energy), is looking for an enthusiastic summer research intern to contribute to research and knowledge translation activities enabling sustainable and culturally responsible battery technologies in Canada's northern settings. **Proposed Activities:** - Formulation of a case study addressing a battery energy storage system (BESS) deployed in a remote setting in Yukon - Engagements with stakeholders (battery suppliers, operators, and end users) in Yukon to exchange information regarding battery specs, best operating practices, and any particular needs - Preparation and instrumentation of battery module samples for lab testing at the University of Toronto - Data post-processing and reporting, including the analyses of relevant scenarios impacting battery performance, longevity, and safety in northern settings - Potential knowledge translation sessions with local Indigenous community rightsholders, governments, and operators of BESS in Yukon
Research Location	On-site, at both the University of Toronto and Yukon University
How to Apply	Email directly (sidra.farid@utoronto.ca) in a single PDF file with the following items: • CV • Unofficial Transcript • Single Paragraph describing interest in the project

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Deadline to Apply	**Open until filled**
Additional Comments	• We are looking for **2nd, 3rd, or 4th-year Engineering students** with background knowledge in lithium-ion batteries, lab testing activities, and renewable energy. Expertise in knowledge translation with Indigenous communities is an asset to the project. • The summer intern is expected to spend 8 weeks at Yukon University in Whitehorse and 8 weeks at the University of Toronto's Thermal Management Systems Lab in Toronto.