

# Anja Kroon

anja.kroon@mail.mcgill.ca   Google Scholar   LinkedIn   GitHub   Website

## Education

---

### MSc Electrical Engineering

Delft University of Technology

Track: Signals and Systems

Autumn 2023 (Start)

- Research interests in graph signal processing and graph neural networks for edge devices.
- Coursework in Convex Optimization, Estimation and Detection, Statistical Digital Signal Processing, Machine Learning on Graphs, Information Theory, Wireless Communications, Bayesian Machine Learning, Data Compression Techniques, Distributed Signal Processing, Array Processing, Hardware Arch. for AI.
- Competitive rower for Delftsche Studenten Roei Vereniging (D.S.R.V.) "Laga"

### BEng Honours Electrical Engineering

McGill University

GPA: 3.7/4.0

Sept 2019 - May 2023

- Thesis on a Proposed Evaluation Method for Categorical Generative Models.
- Varsity Alpine Ski Team Member 2019-2020 and 2020-2021.
- Three publications through summer research internship and bachelor's thesis.
- Coursework in machine learning, deep learning, signal processing, speech communications, statistics, probability, and linear algebra including six graduate EE courses.
- Served for two years representing 1200 students as President and Vice President Academic of the Electrical, Computer, Software Engineering Student Society.

## Publications

---

- [1] Florence Regol, [Anja Kroon](#), Mark Coates, "Evaluation of Categorical Generative Models – Bridging the Gap Between Real and Synthetic Data", IEEE 2023 International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**). June 2023. Preprint: [Link](#).
- [2] [Anja Kroon](#), "Comparing Conventional Pitch Detection Algorithms with a Neural Network Approach", Research project in ECSE 523 Speech Communications. Preprint: [Link](#).
- [3] Yousef Safari, [Anja Kroon](#), and Boris Vaisband, "Power Delivery for Ultra-Large-Scale Applications on Si-IF", Published, IEEE Intl. Symposium of Circuits and Systems (**ISCAS**) May 2022. [Link](#).

## Awards

---

### McGill / Ecole Polytechnique Memorial Prize (December 6, 1989)

Summer 2023

- Awarded to a student in recognition of contributions to making engineering a profession open to the talents of all men and women. Selected among pool of 3000 undergraduate engineering students.
- Awarded by the Faculty of Engineering Scholarships Committee on the recommendation of the Departments.
- Scholarship Amount: \$2458.05

### Dr. Alfred S. Malowany Prize

Summer 2023

- Awarded to a graduating student in recognition of their dedication and impact within the Department of Electrical and Computer Engineering. Selected among a pool of 400 people.
- Awarded by the Faculty of Engineering Scholarships Committee upon recommendation of the Department of Electrical and Computer Engineering.
- Scholarship Amount: \$1464.15

### Councilor of the Year

Spring 2023

- Awarded to a member of the Engineering Undergraduate Society (EUS) for their impact as a member of the EUS student council. Selected among pool of 50 people.
- Awarded by majority vote of the engineering students of McGill University.

### Diane Ferguson Involvement Award

Summer 2022

- Awarded to an EUS member involved in the McGill community with a passion for EUS involvement. Selected among pool of 500 people.
- Awarded by a selection committee of EUS executives and representatives of the McGill Faculty of Engineering.
- Scholarship Amount: \$500

**Vice President of the Year**

Spring 2022

- Awarded to an EUS member of Vice President standing within a design team, departmental council, club, or committee on the basis of reach and impact of their work. Selected among pool of 100 people.
- Awarded by a selection committee of EUS executives.

**Summer Undergraduate Research in Engineering Award**

Summer 2021

- Awarded to a student for their participation in an intensive 16-week summer research traineeship.
- Selected by the Professor whom with the student will spend 40h/wk conducting research with and a selection committee within McGill University's Faculty of Engineering.
- Scholarship Amount: \$8900

**Principal Student Athlete Honour Roll, Varsity Alpine Ski Racing**

Spring 2021

- Awarded to varsity athletes with a CGPA of 3.50/4.00, while consuming a year of collegiate eligibility.

**Tomlinson Engagement Award for Mentoring**

Fall 2020

- Awarded to a student with a marked interest in teaching/learning and educational improvement. Selected among other students in relevant course.
- Awarded by the Professor who with the student will spend 3h/wk shadowing and teaching alongside.
- Scholarship Amount: \$300

## Research and Work Experience

---

**McGill University Networks Research Lab**

May 2022 - May 2023

Bachelor's Thesis Researcher

- Supervision from Professor Mark Coates and PhD candidate Florence Regol
- Worked on a proposed evaluation metric, binning, for categorical generative models over very large sample spaces ( $|\Omega| \geq 10^9$ ). Binning provides correct, meaningful, and interpretable results with statistical guarantees outperforming baselines
- Conducted literature review on generative models, existing comparison metrics and statistics (identity testing, hypothesis testing, estimators, divergence metrics, distance metrics)
- Algorithmic development, experimentation and analysis with Python, Numpy and Matplotlib
- Applied binning to protein sequence modeling demonstrating algorithm feasibility in a real world setting
- Summarized findings in oral presentations, written reports, a bachelor's thesis and two publications
- Attended weekly lab meetings, communicated with supervisors, and completed deliverables on time
- Will present work at ICASSP 2023 in Rhodes, Greece June 2023 with a 15 minute presentation
- Final Thesis: [Link](#). Poster Presentation: [Link](#).

**McGill University RAISE Lab**

Jan 2023 - April 2023

Research Assistant

- Supervision from Professor Ajung Moon and PhD candidate Lixiao Zhu at the Responsible Autonomous and Intelligent Systems Ethics (RAISE) Lab researching the entertainment effect in human-robot interactions
- Wrote participant scripts for human experiments, conducted literature review and experimental setup

**McGill University Integrated Sys. for Information Processing Lab**

Sept 2022 - Dec 2022

Research Assistant

- Supervision from Professor Warren Gross and PhD candidate Marwan Jalaeddine researching error correction codes and emerging techniques for use in 6G
- Conducted literature review and delivered a tutorial on the new NVIDIA Sionna software

**DUST Identity**

May 2022 - Aug 2022

Electrical Engineering Intern

- DUST Identity develops diamond uncloneable security tags to secure supply chains
- Delivered 30+ electrical, mechanical, and materials engineering solutions with four other engineers
- Flagship development of new ARM-microcontroller-based handheld tag scanner which rapidly focus stacked images at 9x lower cost and 2x faster scanning capabilities
- Created custom PCBs with KiCAD, wrote documentation, designed electrical control systems, redesigned and redid existing electrical setups with new components, and linked devices to the API with Python and bash scripting

**McGill University Visual Motor Research Lab**

Jan 2022 - Apr 2022

Research Assistant

- Supervision from Professor James Clark and PhD candidate Fay Askari researching interaction classification with key actor detection in multi person sports videos
- Expanded the training set and conducted validation for a recurrent neural-network (RNN) model identifying penalties and players involved via recorded hockey game tapes
- Contributions improved model performance based on classification accuracy parameters

**McGill University Photonics Systems Group**

Sept 2021 - Dec 2021

Research Assistant

- Supervision from Professor David Plant and PhD candidate Weijia Li researching silicon photonic switches
- Simulated a Mach-Zehnder interferometer for On/Off switching applications examining TE and TM waveguides with differing free spectral range values using MATLAB

**McGill University Heterogeneous Integration Knowledge Team**

May 2021 - Aug 2021

Research Assistant

- Supervision from Professor Boris Vaisband and PhD candidate Yousef Safari researching silicon interconnect fabric (Si-IF), alternative to conventional printed circuit boards (PCBs) and ASIC employing wafer scale heterogeneous integration
- Analyzed the feasibility of proposed power delivery networks for Si-IF, simulating via ANSYS and MATLAB
- Conducted literature review, experimental setup, experimentation, and report writing
- Created 3D artistic renderings unifying current solutions into a single framework
- Poster: [Link](#).

## Volunteering

---

**President**

May 2022 - Apr 2023

The Electrical, Computer, Software Engineering (ECSE) Student Society of McGill University

- Advocate for and represent 1200 ECSE students on issues relating to student rights, student safety, and future undergraduate program plans
- United 5 ECSE related committees under the single parent organization of ECSESS. Managed and empowered the new team of 60+ volunteers with 3+ levels of management and 5 subcommittees to deliver ~25 technical, professional, and personal development events per semester for the students and faculty of the ECSE community teaching event planning to individuals, teaching mentorship and leadership to others, and recognized system bottlenecks and addressing them timely
- Managed relations with the larger Engineering Undergraduate Society (EUS) and served on the EUS Council raising student concerns, voting on initiatives and drafting legislation
- Regularly mentored peers in ECSESS and the ECSE community on undergraduate research opportunities, student involvement opportunities, and their academic studies
- Served on the ECE Search Committee for two new ECSE professors reviewing over 200 applicants, conducting interviews, and gathering student feedback
- Additionally a member of the Dept. Committee on Student Recruitment, Dept. Safety Committee, and Dept. Teaching Laboratory Advisory Committee
- Updated and rewrote 20+ pieces of legislation regarding the internal workings of ECSESS
- Worked with the ECE Dept. to ensure students and faculty have an environment conducive to teaching and learning by ensuring concerns are addressed with respect and in a timely manner

**Vice President Academic**

May 2021 - Apr 2022

The Electrical, Computer, Software Engineering (ECSE) Student Society of McGill University

- Advocate for 1200 ECSE students regarding improvements the curriculum, course offerings, assessment policies and student rights
- Regularly approached students in the community to gather concerns and addressed them with available resources. Raised awareness in the community for student rights
- Addressed ~ 5 student academic concerns every week relating to student rights involving negotiation and conflict resolution and escalating to ECE Dept. if needed

- Organized the creation of an open letter to professors involving the opinions of over 30 students after perceived inequitable final grading in a design course. Students given opportunity to resubmit and pass
- Advocated for the student perspective to 20+ McGill-wide professors in novel assessment and feedback strategies as part of the McGill Assessment and Feedback Group
- Member of the Dept. Curriculum Comm., Dept. Continuous Program Evaluation and Improvement Comm.

### **Ski Trip Coordinator**

May 2021 - Apr 2022

Engineering Undergraduate Society

- Worked with a team of 5 other members to plan a three day long ski trip with 60 people.
- Responsible for marketing, merchandise, negotiations with corporations involved

### **Vice President Academic**

May 2020 - Apr 2021

Sustainability in Engineering at McGill University

- Worked closely with the McGill Office of Sustainability and the McGill's Trottier Institute of Sustainability in Engineering and Design to integrate sustainability into the curriculum and student culture
- Worked to receive accreditation approval for technical sustainability courses in the engineering curriculum
- Organized sustainability related events to work being done by companies and professors in the field

### **Secretary**

Jan 2020 - Dec 2021

Kappa Kappa Gamma Women's Fraternity of McGill University

- Organized 3 workshops with experts in mental health, nutrition, and a workshop for alumni networking.
- Managed chapter correspondence with Headquarters and Alumni regarding workshops, events, and site visits.
- Recorded and distributed weekly meeting minutes.

### **Vice President Events**

Sept 2019 - Aug 2020

Junior Council of the Engineering Undergraduate Society

- Coordinated a team of 20 students planning events for 3,000 first-year engineering students
- Organized ~5 events per semester to enrich the first-year engineering experience
- Directed marketing campaigns, supervised budgeting, managed external clients, and managed event planning teams to deliver timely events fostering personal development

## **Languages and Skills**

---

<b>Languages</b>	English (Native), German (Goethe-Zertifikat C1), Dutch (Nt2 Staatsexamen C1)
<b>Proficient</b>	Python, NumPy, Pandas, Bash scripting, PyTorch
<b>Familiarity</b>	MATLAB, WireShark, Simulink, KiCad, Solidworks, Spice, Java, C, Assembly

## **Other (fun) Facts**

---

My hobbies include skiing very fast, hiking, mountain biking, baking, and reading.

I used to be a semi-professional ski racer attending two schools simultaneously from Grade 6 until Grade 12 while traveling across the world for training and races. I was also a substitute teacher when on campus and responsible for my peers' academics for long-term trips of up to 2 months.

I organized the first and second-ever prom at a school with an average graduating class size of 10, writing contracts, delivering budgets, and managing a team of 6 organizers.

I love politics and world news and have read the New York Times every day for the last 9 years.

I play piano and enjoy transcribing popular songs by ear.