

# ANJA KROON

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## EDUCATION

**B.Eng. Honours Electrical Engineering, McGill University, Montreal, QC**

*Sept 2019 to May 2023*

*GPA 3.6*

*Varsity Alpine Ski Team, 2019-2021*

Research interest areas include signal processing applied to biology, chemistry, and communications systems using ML frameworks.

Advised by Professors Boris Vaisband, James Clark, Douglas O'Shaugnessy, Warren Gross, and Mark Coates.

Coursework in machine learning, statistics, probability, algorithms, signal processing, and linear algebra including 6 graduate level courses.

## EXPERIENCE

**DUST Identity, Boston, MA**

**Electrical Engineering Intern — May to Aug 2022**

Developed the new version a handheld tag scanner with a mechanical engineering team. Created an ARM microcontroller-based system rapidly focus-stacking images for high-security tags. Development included engineering a custom PCB with KiCAD, control system, connection to the API with python and scripting, and documentation. Delivered a product with 9 times lower cost with 2x faster tag scanning capabilities.

**McGill University Machine Learning and Signal Processing Lab**

**Bachelor's Thesis Researcher — May 2022 to Present**

Research under the supervision of Prof. Mark Coates with PhD student Florence Regol. Objective to improve the statistical-based evaluation methods for generative models and applying results to generative protein sequence modeling on probability spaces sized  $16^{16}$ . Ran tests and analyzed results using python, bash scripting, and statistical first principles. Summarized results in progress reports. Paper in development for Fall 2022 submission.

**McGill University Integrated Systems for Information Processing Lab**

**Research Assistant — Sept 2022 to Present**

Research under the supervision of Professor Warren Gross and PhD student Marwan Jalaleddine. Deliver tutorials to the research group on the new NVIDIA Sionna software implementing forward error correction (FEC) codes specifically to aid the development of 6G FEC research.

**McGill University Center for Intelligent Machines****Research Assistant — Jan to Apr 2022**

Research under the supervision of Professor James Clark and PhD student Fay Askari. Using Python, expanded the training set and conducted validation for a RNN model that identifies penalties and players involved via recorded hockey game tapes. Contributions improved model performance based on classification accuracy parameters.

**McGill University Photonics Systems Group****Research Assistant — Sept to Dec 2021**

Research under the supervision of Professor David Plant and Ph.D student Weijia Li. Using MATLAB, simulated a Mach-Zehnder interferometer for On/Off switching applications examining TE and TM waveguides with differing free spectral range values.

**McGill University Heterogeneous Integration Knowledge Team****Research Assistant — May to Aug 2021**

Research under the supervision of Professor Boris Vaisband and PhD student Yousef Safari. Simulated power delivery networks with ANSYS and Simulink for an ASIC employing wafer scale heterogeneous integration. Compared results based on established figures of merit. Created 3D artistic renderings unifying current solutions into a single framework. Paper accepted to IEEE International Symposium for Circuits and Systems (ISCAS May 2022).

**PUBLICATIONS****Anja Kroon, “Comparing Conventional Pitch Detection Algorithms with a Neural Network Approach”**

Research project in ECSE 523: Speech Communications with Prof. Douglas O'Shaughnessy. Presented to course attendees.

<https://arxiv.org/abs/2206.14357>

**Yousef Safari, Anja Kroon, and Boris Vaisband, “Power Delivery for Ultra-Large-Scale Applications on Si-IF”**

Paper and poster at IEEE International Symposium of Circuits and Systems (ISCAS) May 2022.

<https://arxiv.org/abs/2208.13034>

**AWARDS****Diane Ferguson Involvement Award**

Summer 2022. Awarded by McGill University.

**Engineering Undergraduate Society Departmental Vice President of the Year**

Spring 2022. Awarded by Engineering Undergraduate Society of McGill Uni.

**Summer Undergraduate Research Award in Engineering**

Summer 2021. Awarded by McGill University.

**Principal's Student-Athlete Honour Roll**

Spring 2021. Awarded by McGill University.

**Tomlinson Engagement Award for Team Mentoring**

Fall 2020. Awarded by McGill University.

**VOLUNTEERING****President****Electrical, Computer, Software Eng. Student Society, May 2022 to Apr 2023**

Advocate and representative for 1200 ECSE students on issues relating to student rights, student safety, and future undergraduate program plans. Member of the Dept. Search Committee, Dept. Committee on Student Recruitment, Safety Committee, and Teaching Laboratory Advisory Committee. Managed a team of 24 members to deliver technical, professional, and personal development events. Managed secondary team of 8 people to deliver events for first year ECSE students. Supervised a team of 16 people to deliver a university-wide Hackathon. Supervised a team of 14 people to deliver technical workshops in our newly developed student-run hardware design lab.

**Vice President Academic****Electrical, Computer, Software Eng. Student Society, May 2021 to Apr 2022**

Advocate for 1200 ECSE students regarding improvements the curriculum, course offerings, assessment policies and student rights. Member of the Dept. Curriculum Committee, Dept. Continuous Program Evaluation and Improvement Committee, and McGill Assessment and Feedback Group. 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. Resulted in professors allowing resubmission and ultimately no course failures.

**Vice President Academic****Sustainability in Engineering at McGill, May 2020 to Apr 2021**

Worked with the McGill Office of Sustainability to receive accreditation approval for technical sustainability courses in the engineering curriculum. Worked with McGill's Trottier Institute of Sustainability in Engineering and Design to raise awareness for engineering opportunities in sustainability.

**Chapter Secretary****Kappa Kappa Gamma Women's Fraternity, Jan 2021 to Dec 2021**

Recorded and distributed weekly meeting minutes. Tracked attendance. Managed the organization and delivery of the composite. Managed alumni and headquarter relations via email.

**Vice President Events****Engineering Undergraduate Society Junior Council, Sept 2019 - Aug 2020**

Coordinated a team of 20 students to plan events for up to 3,000 first year engineering students collaborating. Directed marketing campaigns, supervised

budgeting, managed external clients and managed event planning teams to deliver timely events fostering personal development.

### **MENTORSHIP**

Promoting Opportunities for Women in Engineering of McGill University, July 2020 to Present

ECSplore Mentorship Program, Electrical, Computer, Software Engineering Student Society of McGill University, Jul 2020 to Present

### **LANGUAGES**

Fluent: English, German, Dutch

Basic: French, Spanish, Latin

### **SKILLS**

Proficient in: Python, NumPy, Bash scripting

Familiar with: Tensorflow, WireShark, Simulink, KiCad, Solidworks, Spice, Java

### **HOBBIES**

Skiing very fast, hiking, mountain biking, and paddle boarding

### **FUN & RANDOM TIDBITS**

I used to be a semi-professional ski racer and attended two schools at the same time while traveling the world for ski races.

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 8 years.

I play piano and have learned to play "Firework" by Katy Perry and "Diamonds" by Rihanna entirely by ear.