

# Edward (Eddie) Guo

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## Education

### University of Alberta | Edmonton, AB

Bachelor of Science in Engineering

Sep. 2020 – Present

### University of Alberta | Edmonton, AB

Bachelor of Science Honors Neuroscience (cumulative GPA: 4.00/4.00)

Transferred to the Faculty of Engineering at the University of Alberta June 2020.

Sep. 2018 – Apr. 2020

### Old Scona Academic High School | Edmonton, AB

Alberta High School Diploma (graduating grade: 95%)

Sep. 2015 – Jun. 2018

## Technical Skills

**Programming:** C++, Python, R, Arduino

**Markup and Version Control:** Git,  $\text{\LaTeX}$ , HTML, CSS

**Software:** GitHub, SPSS, Graphpad Prism, MS Office

**Design:** Fusion 360

## Research and Clinical Experience

### Zochodne Lab | Li Ka Shing Center for Health Innovation, Edmonton, AB

Undergraduate Research Student

Oct. 2018 – Present

- Current project: researching the effects of acute and chronic cutaneous denervation (defined here as a loss of axons) on differential mRNA expression in skin keratinocytes.
- Techniques: mouse nerve microsurgery (sciatic nerve crush), mouse and rat harvesting (sciatic nerve, saphenous nerve, dorsal root ganglion, footpad biopsy), mouse intranasal injections, electroporation, electrophysiological testing, immunohistochemistry, co-IP, Western blot, confocal microscopy.

### Neurosurgery Shadow | Walter C. Mackenzie Hospital, Edmonton, AB

Shadow in the Neurosurgical Operating Room

Jul. 2019

- Shadowed for three surgical cases: deep brain stimulation for Parkinson's disease, microvascular decompression for trigeminal neuralgia, and percutaneous rhizotomy for trigeminal neuralgia.

### Kalra Lab | Heritage Medical Research Centre, Edmonton, AB

Data Auditor

Oct. 2018 – Jun. 2019

- Audited MRI scans and patient data forms for the Canadian Amyotrophic Lateral Sclerosis Neuroimaging Consortium (CALSNIC).

### Baker Lab | Cross Cancer Institute, Edmonton, AB

Gene Researcher for a Week Program

Mar. 2018

- Researched DNA mutations associated with colorectal cancer.
- Techniques: Western Blot, qPCR.

## Employment

### Edmonton Fencing Club | Edmonton, AB

Nov. 2016 – Present

Fencing Coach

- Coaching children to fence and refereeing fencing competitions.
- Fixing and making fencing blades and wires.
- Facilitating demonstrations and open houses.

## Project Experience

### NeurAlbertaTech | University of Alberta

Hardware Team | Eye-Tracking Team Lead

Jan. 2020 – Present

- Modelling and building an eye-tracking apparatus along with software that returns a real-time vector in the direction that the user is looking.
- Creating an application that integrates eye-tracking, body-tracking, and EEG signals. Software driven by PyQt5, Lab Streaming Layer, fast Fourier transforms, and multithreading.

### Introduction to Tangible Computing II (CMPUT 275) | University of Alberta

EEG Visualizer

Apr. 2020 – May 2020

- The application takes an electroencephalogram (EEG) data stream over a local network and visualizes both the raw and transformed signals in a Matplotlib figure embedded in a PyQt5 user interface.
- The program implements the radix-2 decimation-in-time fast Fourier transform algorithm.

Driving Route Finder

Apr. 2020 – May 2020

- A route finder where the user can indicate a start and end point anywhere in the city of Edmonton using a joystick.
- The program uses a client-server model with a desktop C++ program communicating with an Arduino client.
- A desktop C++ program computes the shortest route possible using either the A\* or Dijkstra algorithm and displays it on an Adafruit 3.5" touchscreen display on an Arduino Mega2560.

## Volunteering

### Youreka Canada

Associate Director of Programs | Youreka Canada

May 2020 – Present

- Curating the national Youreka curriculum and analyzing previous curricula. Topics are focused on introductory bioinformatics techniques in the biomedical sciences.
- Coordinating with the Clark laboratory at the Werklund School of Education at the University of Calgary to develop a multi-year research study of the educational effectiveness of the Youreka program.
- Providing judging and awards criteria for student research projects at both the regional and national symposia. This includes selecting promising projects for peer-reviewed journal publications.
- Conducting national teaching sessions and distributing curriculum material to the regional academic directors.

National Operations Committee Member | Youreka Canada

May 2020 – Present

- Spearheaded a curriculum bifurcation pilot project for Youreka Edmonton.
- National short-term strategy and execution.
- Collaboration on Youreka Canada organizational policy and procedures.

Vice President of Academics | Youreka Edmonton

May 2019 – Present

- Provided four live video lectures to all Youreka Canada chapters (University of Alberta, Calgary, Windsor, Queen's) and created slide sets, worksheets, and Python 3 code on introductory statistics during the COVID-19 pandemic.
- Lectured an eight-week program to a group of 60 high school and undergraduate students (2020 cohort).
- Presided over all academic sessions and supplementary material.

Senior Investigator | Youreka Edmonton

**Feb. 2019 – May 2019**

- Mentoring high school students to do research involving bioinformatics.
- Facilitating and ensuring quality of projects, and compiling team data for a public research symposium.
- Received best senior investigator award for exemplary leadership of a research team.

**Canadian Blood Services | Edmonton, AB**

Stem Cell Board Coordinator

**Sep. 2019 – Present**

- Planning, coordinating, and executing Canadian Blood Services stem cell related events (ex: patient campaigns) with staff and volunteers. There are typically one or two stem cell recruitment events per month.

Stem Cell Board Member

**Sep. 2018 – Present**

- Planning and executing Canadian Blood Services stem cell related events.
- Providing public education about stem cell donations (ex: presentations at major Edmonton high schools and university student groups, exhibitions at the Telus World of Science, etc.).

Edmonton NextGen Lifeline Committee

**Sep. 2018 – Present**

- Recruitment for blood donations and informing the public about blood and stem cell donations.
- Lead developer of a volunteer database framework, digitization and automation of volunteer resources (volunteer contracts, event forms, event data).
- Created a Python 3 Tkinter application that queries and analyzes volunteer contracts from an SQL database.
- Migrated Canadian Blood Services Youth Committee event data from 2011-2019 to an SQL database.

Summer Youth Program

**Jun. 2018 – Aug. 2018**

- Volunteer of the month, June 2018.

**Edmonton World Health Organization (eWHO) | University of Alberta**

Vice President Finance

**Apr. 2019 – Jun. 2020**

- Wrote grant applications for the eWHO conference.
- Managed eWHO funds.

**Office of the Registrar's Student Advisory Committee | University of Alberta**

Member

**Oct. 2018 – Apr. 2020**

- Provide feedback on student services (ex: University of Alberta Calendar, admissions website).
- Give input on potential University of Alberta projects (ex: Green and Gold Getaway).

**Brain Awareness Movement | University of Alberta**

Director of Education

**Apr. 2019 – Sep. 2019**

- Organizing and giving presentations throughout Edmonton on brain awareness.

Event Facilitator

**Oct. 2018 – Apr. 2019**

- Outreach for sponsorships and event planning.

## Sports

### Fencing (Foil)

Feb. 2011 – Present

#### International

- 23rd Guatemala Junior (U20) World Cup Dec. 2016
- Ranked A16 in the USA (qualified for Division 1) Dec. 2016

#### National

- 3rd Senior (Open) Canada Cup West, Winnipeg, MB Nov. 2018
- 2nd Junior (U20) Canada Cup West, Winnipeg, MB Nov. 2018
- 2nd Cadet (U17) Western Canadian Championships, Calgary, AB Nov. 2017
- 3rd Cadet (U17) Canada Cup, Longueuil, QC May 2015
- 3rd Y14 Canada Cup, Richmond, BC Dec. 2013

### Table Tennis

Jan. 2006 – Jul. 2011

- 1st U-1500 Round Robin Milwaukee Table Tennis Open Jul. 2011
- Halifax 2011 Canada Winter Games – 5th team, 19th individual Feb. 2011
- See the CBC interview [here](#).

## Certifications

### Construction Safety Training System (CSTS 2020) – Fundamentals

Aug. 2020

Alberta Construction Safety Association

### Engineering Laboratory Safety Orientation & Training

Jul. 2020

University of Alberta

### Fundamentals of Reinforcement Learning

Mar. 2020

University of Alberta and Alberta Machine Intelligence Institute on Coursera

### CCAC Training for Animal Users Part II: The Care and Use of the Laboratory Mouse

Jun. 2019

University of Alberta (Research Area: Health Sciences)

### CCAC Training for Animal Users Part I: Ethics of Animal Use (IAUTP)

May 2019

University of Alberta

### Concepts in Biosafety 2018

May 2019

University of Alberta

### Laboratory and Chemical Safety 2018

May 2019

University of Alberta

### WHMIS 2019

Jan. 2019

University of Alberta

### Emergency First Aid Level A CPR and AED

Jul. 2018

St. John Ambulance

### Diplôme d'études en langues française niveau B1 (translation: French studies diploma level B1)

May 2018

Ministère de l'Éducation nationale (translation: Ministry of National Education)

### Advanced Rudiments First Class Honours with Distinction

Oct. 2015

The Royal Conservatory of Music

### Grade 8 Piano First Class Honours

Oct. 2015

The Royal Conservatory of Music

## Honours and Awards

### STEM Fellowship Undergraduate Big Data Challenge: 2nd Place Public and Personal Health Decisions Research Excellence Awards Jul. 2020

- Project titled "Deep learning transcriptomic model for prediction of pan-drug chemotherapeutic sensitivity."
- Hackathon theme: *Personal and Public Health Decisions in a New Open Data Reality*. 523 participants across Canada and America. See the manuscript and source code [here](#). See the video [here](#).

### COVID-19 Data Science Hackathon Post-Secondary Student Award May 2020

- Developed an interactive application using a multivariate regression model to better understand the impacts of age, poverty, income, and population density on the spread of the COVID-19 virus. The application was developed with R Shiny and dygraphs and embedded in a website.
- The goal of the hackathon was to collect and curate worldwide open data and to refine, transform, and link that data to provide a visualization regarding the impact of COVID-19. The hackathon hosted by Alberta Innovates, CYBERA, and the Pacific Institute for Mathematical Sciences. 120 individuals and teams competed in the hackathon.
- See the project [here](#). See the University of Alberta story [here](#). See the Alberta Innovates media announcement [here](#) (my team is called "Youreka Data Science"). See the CYBERA media announcement [here](#).
- Awarded by Alberta Innovates.

### Alberta Innovates Summer Research Studentship Apr. 2020

- Grant for summer research project titled "Skin and Nerves: Understanding the dialogue between axons and skin cells to restore sensation."
- Awarded by the Undergraduate Research Initiative, University of Alberta.

### Undergraduate Researcher Stipend (declined) Apr. 2020

- Grant for summer research project titled "Skin and Nerves: Understanding the dialogue between axons and skin cells to restore sensation."
- Awarded by the Undergraduate Research Initiative, University of Alberta.

### Sci5 Outstanding Achievement in Science Scholarship Mar. 2020

- Awarded to 4 well-rounded students with strong academic achievement, extracurricular involvement, and recommendation letters.
- Awarded by the Interdepartmental Science Students' Society at the University of Alberta.

### Louise McKinney Post-Secondary Scholarship Dec. 2019

- Awarded on the basis of superior academic achievement (top 1.5-2% of faculty) to students at the University of Alberta who are also Alberta residents.

### University of Alberta Undergraduate Scholarship Sep. 2019

- Awarded to students with superior academic achievement.

### T4K Undergraduate Leadership Scholarship Sep. 2019

- Awarded to students at the University of Alberta with superior academic achievement who demonstrate leadership through involvement and participation in university or community organizations, sports activities, or cultural activities.

### Faculty of Science Undergraduate Scholarship Sep. 2019

- Awarded to students with superior academic achievement enrolled in the second, third, or fourth year of an undergraduate degree in the Faculty of Science at the University of Alberta.

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| <b>Office of the Provost and VP (Academic) Summer Studentship Award</b>  | <b>May 2019</b>  |
| <ul style="list-style-type: none"><li>• Grant for summer research project titled “Axon regrowth and plasticity in diabetic neuropathy: the role of growth cone molecules.”</li><li>• Awarded by the Faculty of Medicine and Dentistry, University of Alberta.</li></ul>                                |                  |
| <b>Dean’s Honor Roll 2018-19, Faculty of Science</b>   | <b>May 2019</b>  |
| <ul style="list-style-type: none"><li>• Awarded to students at the University of Alberta with a Grade Point Average of 3.5 or higher.</li></ul>  |                  |
| <b>Sci5 Outstanding Achievement in Science Scholarship</b>   | <b>Apr. 2019</b> |
| <ul style="list-style-type: none"><li>• Awarded to the top 5 students in the Faculty of Science at the University of Alberta who also demonstrate exceptional extracurricular activities.</li><li>• Awarded by the Interdepartmental Science Students’ Society at the University of Alberta.</li></ul> |                  |
| <b>Alexander Rutherford Scholarship</b>  | <b>Aug. 2018</b> |
| <ul style="list-style-type: none"><li>• Awarded to high school graduates with exceptional academic standing over all three years of high school.</li></ul>   |                  |
| <b>Service Award</b>   | <b>Jun. 2018</b> |
| <ul style="list-style-type: none"><li>• Awarded by Old Scona Academic High School.</li></ul>   |                  |
| <b>Jujie Luan Travel Bursary</b>   | <b>Mar. 2013</b> |
| <ul style="list-style-type: none"><li>• Awarded to upcoming fencers travelling for competitions.</li></ul>   |                  |
| <b>Recognition of Accomplishment at the Canadian Table Tennis Championships</b>  | <b>Jan. 2011</b> |
| <ul style="list-style-type: none"><li>• Awarded for exceptional performance at the 2011 Canadian Table Tennis Championships.</li></ul>   |                  |