

# GRACE ATTALLA

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## SUMMARY

**Biomedical engineering student** who has experience in neuromodulation research, designing and fabricating clinical testing devices, clinical experimental procedures, and founding and growing a successful nonprofit company. An adaptable technical contributor and dedicated team member who performs under pressure and enjoys working with multidisciplinary team members on challenging problems.

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## EDUCATION

### **B.A.Sc Biomedical Engineering**

University of Toronto, Toronto, ON

**3.85 GPA**

2021-2026

- Major Awards: Full-ride scholarship, 4 years, \$140k CAD. University of Toronto's most prestigious scholarship for Canadian students (National Scholarship). One of fifteen students selected across all faculties recognizing original thinking, high academic achievement and strong community involvement.
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## SKILLS

- SolidWorks, 3D Printing, Python (Pandas, PyTorch), C, Microcontrollers, System Verilog, Machine Learning
  - Experimental clinical procedures for brain computer interface and spinal cord injury: EEG Acquisition, Epidural Spinal Stimulation, Transcranial Doppler Ultrasound, Vascular Ultrasound, Tilt Test, EKG, Polysomnography
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## EXPERIENCE

### **BRAIN COMPUTER INTERFACE FOR PEDIATRICS LAB, RESEARCH STUDENT**

**MAY 2023 - AUG 2023**

Alberta Children's Hospital, Dr. Adam Kirton

*Member of multidisciplinary research team developing brain computer interfaces for children with cerebral palsy.*

- Optimized and assessed machine learning model (MediaPipe) for pose estimation use in clinical brain computer interface setting to analyze physical fatigue.
- Increased model performance by 17% with creative combination of multiple machine learning models.
- Systematically informed future experimental designs to enhance model performance through 6 strategic recommendations.
- Publication included summer work to broaden applicability with the inclusion of novel clinical results.

### **SPINAL CORD INJURY LAB, RESEARCH STUDENT**

**MAY 2022 - AUG 2022**

Hotchkiss Brain Institute, Dr. Aaron Phillips

*Member of research team conducting a clinical trial to assess feasibility of epidural spinal stimulation neuromodulation in individuals with spinal cord injuries to restore hemodynamic stability.*

- Designed, fabricated and validated (for efficacy and safety) a custom leg brace to enable clinical spasticity testing under a tight 1 month timeline. Device is implemented in clinical testing and approved by senior clinician-scientists (MD, B.A.Sc).
- Troubleshooted and conducted 9 clinical testing procedures utilizing a range of experimental instrumentation.
- Developed 11 standard operating procedures for clinical trial which increased experimental efficiency.
- Streamlined analysis of dataset collecting clinical metrics from people with spinal cord injuries.

### **QUANTIFYING LEARNING ECOSYSTEM LAB, RESEARCH ANALYST**

**APR 2021 - AUG 2021**

Mount Royal University, Dr. David Finch

*Member of career development research team quantifying the Calgary learning ecosystem.*

- Efficiently analyzed 400 learning programs using 80 metrics to exceed weekly team targets.

### **JOY TO JOB, CO-FOUNDER & HEAD OF GROWTH**

**2020 - PRESENT**

*Co-founder of a non-profit start up that helps students in their career exploration by connecting them with professionals. This is achieved through monthly panelists webinars on a broad variety of career fields.*

- Championed the creation of Joy to Job and led a team of 8 members to create a self-sustaining operation.
- Executed 24 webinars resulting in the connection of 90 panelists with 1300+ registered students.
- Acquired \$8,000 in sponsorships by analyzing and pitching outreach data to corporations and institutions.

## **PROJECTS**

### **MULTICLASS BRAIN TUMOR SEGMENTATION**

**JAN 2024-MAY 2024**

- Used PyTorch machine learning library to segment multiple classes of glioma tumors from a 3D MRI dataset.

### **BREATHING FEEDBACK SYSTEM, UNIVERSITY OF TORONTO DESIGN TEAM**

**SEPT 2022-MAY 2023**

- Developed prototype to analyze breathing data with biofeedback for Anahana Wellness Corporation. Responsible for vibrational motor feedback system and collaborated closely with multidisciplinary team.

### **MECHATRONIC BAMBOO WEAVING DEVICE**

**JAN-MAY 2023**

- Developed, iterated and validated a bamboo weaving system for a rural Thailand community. System included 3D printed structure, motor, colour sensor and LED indicators.

### **PARKINSON'S FREEZE OF GAIT AI DRIVEN STIMULI**

**FEB 2021**

- 1<sup>st</sup> place in University of Toronto biomedical engineering design competition for AI driven stimuli concept.

## **PUBLICATIONS & PRESENTATIONS**

### **3 MINUTE THESIS COMPETITION, (1<sup>ST</sup> PLACE)**

**JAN 2024**

- Women in Science and Engineering Conference

### **ABSTRACT PUBLICATION**

**JAN 2024**

- Undergraduate Research in Natural and Clinical Science and Technology (pending)

### **VALIDATING MEDIAPIPE AS MARKERLESS POSE ESTIMATION ALTERNATIVE TO 3D MOTION CAPTURE FOR UPPER EXTREMITY MOVEMENT**

**AUG 2023**

- IEEE Transactions on Neural Systems and Rehabilitation Engineering Journal (pending)

### **ORAL PRESENTATION & ABSTRACT**

**AUG 2023**

- University of Calgary Biomedical Engineering Research Symposium

### **POSTER PRESENTATION & ABSTRACT**

**AUG 2022**

- University of Calgary Undergraduate Research Symposium

## **VOLUNTEERING**

### **ENGINEERING AMBASSADOR, UNIVERSITY OF TORONTO**

**JAN 2023 - PRESENT**

- Chosen to speak on panels with Vice Dean, and present to prospective students, families and donors at recruitment events as a representative of the engineering faculty. Resulted in full time hired position.

### **TECHNOLOGY AND CAREER DEVELOPMENT YOUTH SPEAKER**

**2020 - PRESENT**

- Speaker on several international, City of Calgary and Alberta government panels on youth career development.

## **OTHER AWARDS**

- University of Toronto Engineering Dean's Merit Award (\$10k CAD)
- Loran Provincial Award (\$2k CAD)