

# Joshua Himmens

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**Undergraduate Engineering Physics Student** at The University of British Columbia

**92% (A+)** Average | **English, French** (Working Knowledge) | [Github/Joshuah143](https://github.com/Joshuah143)

## Technical Skills

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**Machine Learning** | TensorFlow, Keras, PointNet, Weights and Biases (wandb), ONNX

**Embedded Programming** | Experienced with FreeRTOS on TMS570, RP2040, and STM32

**Software Development** | C, C++, Python, Java, MATLAB, Bash, Git

**Particle Physics** | Root, CERN grid compute, Athena

## Technical/Research Experience

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### ATLAS Deep Learning Research Student

TRIUMF | 05/2024 - Present (part time from 09/2024) | [himmens.com/triumf](https://himmens.com/triumf)

ATLAS detects particles from the Large Hadron Collider colliding at 99.999999% the speed of light to explore the bounds of physics.

- Developed panoptic segmentation models for the ATLAS detector using the PointNet ML framework with Wandb, TensorFlow, Keras.
- Used ONNX to implement models in C++ for deployment on the ATLAS Athena system.
- Used CERN's grid computing to parallelize compute across thousands of nodes.
- Worked independently to develop models using cutting edge transfer learning approaches.

### Command and Data Handling (CDH) Lead and Firmware Developer

UBC Orbit Satellite Team | 10/2023 - Present | [himmens.com/orbit](https://himmens.com/orbit)

ALEASAT is an earth observation cubesat supported by the European Space Agency and UBC.

- Led the CDH team to develop software to meet mission and testing objectives from ESA (European Space Agency) for the ALEASAT project.
- Managed a team of 10 firmware developers, with over 40 tasked, 1300 CI builds, 2000 lines of code completed/written.
- Developed mission testing, function testing, and acceptance testing procedures to meet ESA and ECSS standards.
- Programmed device drivers and electrical ground support equipment (EGSE).
- Developed the ALEASAT Avionics Test Bench (FlatSat).

## Publications and Presentations

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Presented **Developing Machine Learning Techniques for Particle Flow in the ATLAS Experiment** at the Canadian Astroparticle Physics Summer Student Talks Competition (CASST 2024), where I **placed 2nd** of 44 presentations.

Presenter of **JetPointnet: A Machine Learning Approach to Cell-to-Track Attribution in the ATLAS Experiment** to be presented at the Canadian Undergraduate Physics Conference in October 2024.

Presented **3D Particle Flow in the ATLAS Calorimeter: How to Train Your Model**, a speed-talk, at the 2024 TRIUMF Science Week

Presented **ALEASAT ESA "Fly Your Satellite!" Training Week Presentation** at the European Space Agency's ESEC-GALAXIA (Transinne Belgium) in 2024 as part of the "Fly Your Satellite 4!" program.

## Awards

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**Erich Vogt First Year Summer Research Experience (FYSRE) Award** | 2024

Awarded to promising students in physics for a 4 month research placement.

**Alberta Centennial Award and Alberta Premier's Citizenship Award** | 2023

Awarded for outstanding community service. Value: \$2000

**Calgary Flames Foundation Community Involvement Scholarship** | 2023

Awarded for community involvement. Value: \$2005

**Julia Turnbull Leadership Award for exceptional community service** | 2023

Awarded for exceptional community service. Value: \$1000

**Ted Rogers Entrance Scholarship** | 2023

Awarded for academic achievement. Value: \$2000

## Advocacy and Leadership

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### Curriculum and Advocacy Director

UBC Engineering Undergraduate Society  
2024 - Present

- Worked with the faculty and the undergraduate society to develop multi-year plans for coop-related advocacy.
- Advocated for transparency in coop fee use in line with standards at other institutions.

### Advisory Team Member

Child Rights Connect  
2021 - 2023

- Provided guidance to UN delegations on communication strategies for high-level rights goals.
- Presented to governments and consulted on international initiatives to support the UN Convention on the Rights of the Child.

## Experiences

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- **"Quantum School for Young Students"** participant at the University of Waterloo and Institute for Quantum Computing.
- **"Introduction to Quantum Computing"** participant, an 8-month course on quantum computing using IBM's quantum infrastructure.
- **Scientific Computing with Python certification** (300 hours).