

Nicholas Bratvold

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Education

University of British Columbia

BASc Engineering Physics

Student Council Vice President Events

Expected graduation date: Apr. 2024

GPA: 83/100

Experience

Zen Maker Lab

May. 2021 - Dec. 2021

Engineer Project Designer

Python, C++, Unity, Fusion 360, 3D printing

- Developed a \$25 Battle-Bot design kit with MDF Lincoln Log assembly, modular C++ interface, and hobbyist electronics.
- Lead a project-based learning program to empower student's ambitious ideas and equip them with the skillset to realize them, such as; a Tesla coil, a self-watering plant pot, and a wildlife camera website.

MCW Group of Companies

Jan. 2020 - Apr. 2020

Electrical Distribution Design Assistant

GIS, SKM Powertools, AutoCAD, Excel

- Evaluated power distribution assets throughout BC in order to recommend new asset design.
- Conducted arc flash studies on contracted airport electrical circuits in western Canada, including YVR's new LiDAR Tower. Used SKM Powertools to recommend optimal breaker and fuse settings, produce arc flash safety labels, and produce formal reports.

Projects

EleutherAI

Sep. 2023 - Ongoing

Generative AI Video Model

Python, JAX, OpenCV

- An open source model that generates video through a two-stage architecture consisting of a variational autoencoder and diffusion transformer, supporting a 500x312 resolution at various video lengths.
- Achieved 100x training speed improvement by implementing data parallelism and refactoring input data processing.
- Currently adjusting hyperparameters to improve generated video quality and assess model scalability.

UBC Envision

Sep. 2023 - Ongoing

Brewing the Internet of Things - Instrumentation Member

Python, C++, SQL

- Designed device to automate lab equipment to test ultrasonic effects on fermentation processes.
- Rebuilt PostgreSQL database and incorporated brewing sensors to remotely track brewing parameters.

University of British Columbia

Sep. 2021 - Apr. 2022

Portable Fentanyl Quantification Device

Python, OnShape, PCB Design, Microfluidics

- Integrated a proven three-stage process of chromatography, voltammetry, and computational analysis to produce precise readings of fentanyl and other drug concentrations. Capable of detecting 100x below the lethal dose of fentanyl.
- Designed and validated a 50µL electrochemical flow cell to ensure accurate results. Prioritized a portable design with a GUI to allow ease of transport and increase investor interest in the product.

University of British Columbia

Jan. 2021 - Apr. 2021

License Detection AI

Python, Tensorflow, Keras, OpenCV, ROS

- Combined computer vision and a CNN to accurately identify license plate characters from a simulated race course.
- Driving was controlled by a reinforcement learning model. Drove 35% faster than its competitors.

University of British Columbia

May. 2020 - Aug. 2020

Autonomous Recycling Robot - 1st Place

C++, SolidWorks

- Created a STM32 controlled autonomous robot from scratch that could move cans into a recycling box.
- Designed and constructed electrical circuit with noise cancellation, ADC, and H-bridge motor control.

Skills

Languages:

Python, C++, Java, MATLAB, HTML/CSS

Technologies & Tools:

CV2, JAX, TensorFlow, PyTorch, Keras, ROS, Git, Linux, Cadence, SolidWorks, 3D Printing

