

# Axel Jacobsen

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## PROJECTS

### SENSOR TEAM LEAD | UBC SUBBOTS

SEPT 2018 – PRESENT

*Constructing an autonomous robotic submarine to compete in the 22nd International RoboSub Competition*

- Used Matlab to calibrate fisheye cameras for a computer vision algorithm used to navigate the course
- Designed the motor controlling system for 6 independently controlled thrusters to minimize cost and power consumption
- Lead and taught two junior engineering students in best practices, design methodologies, leadership

### ROBOT COMPETITION | ENGINEERING PHYSICS

MAY 2018 – AUG 2018

*Designed and built a robot to autonomously retrieve objects on an obstacle course*

- First team in the history of the competition to use a neural network; used for locating objects on the course
- Used the Goertzel Algorithm to quickly and accurately identify 10 kHz IR signals from noisy real-time data
- Wrote main control software in C on an ARM STM32 to control the robot
- Designed and created circuits and software to control mechanical arm/claw  
See [axel-jacobsen.github.io/ENPHRobot/](https://axel-jacobsen.github.io/ENPHRobot/)

## EXPERIENCE

### DATA SCIENCE CO-OP | CONTROL MOBILE

JAN 2018 – APR 2018

*Control Mobile aggregated and displayed transaction data for over 100 companies that used Stripe/Square/Paypal*

- Wrote Python scripts to analyze and rank order over 300 individual SQL queries by their runtime in order to systematically optimize the SQL database; reduced the runtime to fetch and display customer data by 65%
- Worked with the agile backend team to fix existing bugs, write new code, and to refactor current code
- Fixed security issues that would leave the website vulnerable to SQL injection attacks

### JUNIOR SOFTWARE DEVELOPER | UBYSSSEY.CA

MAY 2017 – AUG 2017

*The Ubyyssey is the campus newspaper for the University of British Columbia*

- Wrote Python/Javascript code for Dispatch, the publishing platform for The Ubyyssey
- Created Django and React UI for Dispatch that allows content to be written and uploaded to the website by non-technical users such as editors, writers
- Refactored old Django code to current best practices for security, readability and reliability

## VOLUNTEER EXPERIENCE

### ENGINEERING PHYSICS MENTOR | UBC

SEPT 2018 – PRESENT

- Mentor of five 2nd year Engineering Physics Students

### SQUADRON COMMANDER | 103 THUNDERBIRD SQUADRON, ROYAL CANADIAN AIR CADETS

APR 2015 – JULY 2016

- Leader of a squadron of 80 cadets
- In charge of weekly squadron meetings, mentoring senior cadets and enforcing standards of leadership and citizenship of the squadron

## EDUCATION

### UNIVERSITY OF BRITISH COLUMBIA

EXPECTED MAY 2021

- Bachelor of Applied Science, Engineering Physics

## ABOUT ME

### PROGRAMMING LANGUAGES

Python • C • Java  
JavaScript • MATLAB  
L<sup>A</sup>T<sub>E</sub>X

### SUMMARY

I am an enthusiastic Engineering Physics Student at the University of British Columbia, with a passion for mathematics, physics, and robotics. I spend my free time working on my personal projects, climbing, biking, or skiing.