

David Black

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Education

B.A.Sc. Engineering Physics

University of British Columbia, Vancouver

(September 2016 — May 2021)

Engineering Physics is the combination of mechatronics engineering with the equivalent of an honors degree in physics. By building off a comprehensive foundation of physics and mathematics, the goal is to develop and design innovative engineering solutions at the forefront of technology.

Experience

Engineering Physics Capstone Project

BC Cancer Research Centre / UBC Vancouver

(September – April 2020)

Designing and building a robotically actuated, physiologically accurate, anthropomorphic phantom for use in PET motion correction studies. Involves mechatronic design, fluid dynamics, and PET physics, as well as project management skills in an interdisciplinary team of engineers, biologists, and physicists.

UBC Robotics and Control Laboratory (Co-op)

UBC Vancouver

(April – December 2019)

Working towards a haptic feedback system for the da Vinci surgical robot. This involves a variety of mechanical design tasks like CAD modeling, robot kinematics and dynamics, and rapid prototyping. I also worked in Python, C++, and MATLAB using ROS, da Vinci Research Kit, designing flexible PCBs, serial communication systems, and master/slave teleoperation while directly modifying the da Vinci robot.

Advanced Development Intern (Co-op)

Carl Zeiss Meditec AG, Oberkochen

(January 2018 — April 2019)

Working in a small team on a new technology in the field of quantitative fluorescence microscopy-based neurosurgery. This involved lab research and design work in the fields of optics and biophotonics, as well as programming and data analysis using computer vision, image processing, and augmented reality. Upon completion of the 4-month internship, I was hired through Zeiss Canada to continue work on the project (40 hrs per month).

UBC Engineering Physics Robot Course

UBC Vancouver

(June — August 2018)

In this intensive course we were given 6 weeks to build an autonomous robot that performs a variety of challenging tasks. In competition our robot was the only one of 20 to complete all the tasks. Please see my team's website for more information: <https://scooter2018enph.wordpress.com/>

Vehicle Dynamics Team Lead

UBC Solar Team

(September 2016 — January 2018)

UBC Solar Car Team is a student engineering design team dedicated to creating a fully solar powered car. I learned about project management, vehicle dynamics, applying for funding, and CAD and simulation software.

Referee

BC Soccer

(September 2011 — April 2017)

I refereed youth soccer at all levels, from U11-U18, often doing 4-5 games per week. This is a high-pressure job involving quick thinking, decision making, and leadership.

Floor Staff

Mountain Equipment Co-op, Vancouver

(April — September 2016)

Skills

Hard Skills / Experience

- C++, MATLAB, LaTeX, Python, Robot Operating System, Microsoft Office, da Vinci Research Kit (very familiar)
- C, Java, Assembly Language (proficient)
- CAD (Solidworks, Onshape), FEA and CFD (ANSYS)
- Prototyping using 3D printers, laser & water-jet cutters, lathes, mills, saws, and drills
- Rigid/flex PCB design using Altium
- Control systems, PID, teleoperation
- Real-time systems and communication through RS-485 and RS-232 serial to USB, PCIe
- Analog and digital circuit design, prototyping, and debugging
- Microcontrollers/computers including Arduino, STM32, Raspberry Pi
- Mechanical design
- Robotics (mechanical design, kinematics, dynamics, controls)
- Stepper motors, servos, motor controllers, rotary encoders, IR sensing, analog signals processing, etc.

Awards and Recognition

- Edith Grace Buchan Scholarship (November 2019)
Awarded for excellence in engineering, nominated by a member of the Faculty of Applied Science
- UBC Science Coop International Work-term Award (January 2018)
Awarded for outstanding international work term placement for coop
- Trek Excellence Scholarship for Continuing Studies (September 2017)
Awarded to students in the top 5% of their faculty and year