

# Adam Schonewille

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## Research & Work Experience

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### Drone Logics Ltd.

*Burnaby, Canada*

ROBOTICS ENGINEER/DRONE TECHNICIAN

*June 2018 – Aug. 2018*

- **Robotic Arms:** Fixed several controllability issues in software and in electrical design on two robotic arm prototypes. These robot arms have 1 and 2 degrees of freedom mount to chase cars for filming applications where their payload is a camera gimbal.
- **Electrical Circuit Design:** Designed and built circuits for DC high voltage and current power switching, RFID wireless communication, brushed and brushless DC motor speed control, signal wiring, and micro-controller processing (Arduino).
- **Software Development:** Developed the software in C/Arduino to control the pan and tilt motions of the robotic arms, included implementing safety features and fail-safes.
- **Commercial Production and Manufacturing:** Collaborated to develop controller prototypes (electrical components, packaging and enclosures) as well as plans for future mass production of designed controllers.
- **Documentation:** Kept a detailed report of engineering work and notes on how the system functions for the next person the project is passed onto.
- **Troubleshooting and Repairs:** Aided in the diagnosis and repair of several commercially available drones for multiple clients.

### University of British Columbia – Faculty of Applied Science

*Vancouver, Canada*

ROBOTICS TEACHING ASSISTANT

*May 2018 – Aug. 2018*

**About:** The ENPH 253 summer course is a rigorous 4 month course where students design, fabricate, and test prototype autonomous robots to compete against their peers in a competition at a end of course. Students design and build their own motor controller circuits, filters, IR detection circuits, power distribution circuits, as well as constructing everything from the robots chassis to wheels and appendages. Students have access to a variety of tools and materials, utilizing a water jet cutter, laser cutter, 3D printers, drill press, mills, lathe, and power tools to build their robots.

- **Troubleshooting:** Helped students debug their circuits when they broke or worked unexpectedly. Provided guidance in electrical changes and improvements. Analyzed student's code to help fix electrical problems. Showed students the microcontroller electrical schematics to show them how to solve their problems.
- **Mechatronics projects:** Miscellaneous projects the instructor outsourced to me. These included making IR beacons, a RFID tag door opener, and the electronics of the competition surface.
- **Teaching and Advising:** Commented on students mechanical designs and provided insight. Helped students brainstorm solutions to their mechanical design problems. Provided suggestions to electrical circuit design to reduce noise and enhance performance.

### NORAM Engineering and Constructors Ltd. – Electrochemical Group

*Vancouver, Canada*

MECHANICAL ENGINEER CO-OP

*May 2017 – Aug. 2017*

**About:** NORAM is a Vancouver-based company that develops engineers, and commercializes technologies and equipment packages for the chemical, pulp and paper, minerals processing and electrochemical sectors. They also work with early-stage technology companies providing engineering design and fabrication support, as well as giving advice in technology commercialization.

- **Mechanical Design:** Worked within the Electrochemical group as a mechanical engineer co-op. Gained practical experience in mechanical design, SolidWorks modeling, prototyping, piping, structural mechanics, fluid dynamics and heat transfer.
- **Commercial Production:** Helped to design and build the infrastructure necessary for assembly production of commercial cells to build a commercial plant. Contributed substantial work to multi-million dollar projects.
- **Documentation:** Wrote reports to send to clients, documented prototype progress and kept a detailed logbook of research and development experiments.

### Laser Zentrum Hannover e.V. – Laser Micromachining Group

*Hannover, Germany*

ADDITIVE MANUFACTURING RESEARCH POSITION WITH DR. KOTARO OBATA AND ARNDT HOHNHOLZ

*May 2016 – Dec. 2016*

**About:** Laser Zentrum Hannover is a research institute supported by the Lower Saxony Ministry for Economics, Labour and Transport, and is devoted to the selfless promotion of applied research in the field of laser technology and optics.

- **Independent Research:** Conducted various experiments in additive manufacturing with new materials. Gained experience with PDMS and micro-fluidics as well as micro-stereolithography with unique polymers and acrylates.
- **Academic Publications:** Wrote and edited papers based on findings. Co-author on two manuscripts.
- **Safety Training:** Trained for Laser Safety as working environment included optics and hazardous lasers. Trained and worked with toxic and combustible chemicals.

## University of British Columbia – Department of Chemistry and Physics

Vancouver, Canada

TECHNICAL UNDERGRADUATE RESEARCH ASSISTANT FOR DR. TAKAMASA MOMOSE

Jan. 2015 - Apr. 2015

**About:** Worked in Dr. Takamasa Momose's lab conducting research on the physics and chemistry of extremely cold molecules and atoms. The lab contains various operational apparatuses including Zeeman and Stark decelerators, counter rotating nozzles, and a parahydrogen matrix system for making cold and ultracold molecules.

- **Machining Experience:** Utilized lathes, milling machines, drill press, power tools, hand tools, a waterjet cutter and laser cutter to quickly create working prototypes for use in the lab.
- **Data Acquisition and Analysis:** Worked with several graduate students simultaneously, helping run multiple experiments. Performed data acquisition and analysis through MATLAB simulations.
- **Research Assistant:** Presented several times to colleagues as part of scheduled weekly meetings. Received acknowledgement for my work in the lab in both a PhD thesis and published paper.

## Research Publications

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### JOURNAL PUBLICATIONS

Obata, K., **Schonewille, A.**, Slobin, S. et al. (2017). "Hybrid 2D patterning using UV laser direct writing and aerosol jet printing of UV curable polydimethylsiloxane." Appl. Phys. Lett. 111:121903

Obata, K., Slobin, S., **Schonewille, A.** et al. (2017). "UV laser direct writing of 2D/3D structures using photo-curable polydimethylsiloxane (PDMS)." Appl. Phys. A. 123:495.

## Education

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### University of Toronto

Toronto, Canada

MASTERS OF APPLIED SCIENCE IN MECHANICAL AND INDUSTRIAL ENGINEERING

Sept. 2018 - Present

- **About My Degree:** Currently a MAsC student under the supervision of Prof. Eric Diller doing research in magnetically actuated micro-robotics.

### University of British Columbia

Vancouver, Canada

BACHELORS OF APPLIED SCIENCE IN ENGINEERING PHYSICS WITH MECHANICAL ENGINEERING SPECIALIZATION

Sept. 2013 - May 2018

- **About My Degree:** Engineering Physics is a physics and applied mathematics program enriched by design fundamentals in electrical and mechanical engineering.
- **Relevant Courses:** Mechanics, Statics and Dynamics, Mechanical Design, Signals and Systems, Industrial Robotics, Sensors and Actuators, Control Theory, Calculus, Advanced Methods in Mathematics, Machine Learning, Electricity and Magnetism, Statistics, Quantum Mechanics, Optics and other topics in Physics.

### Aldergrove Community Secondary School

Aldergrove, Canada

SECONDARY SCHOOL

Sept. 2008 - June 2013

- Graduated top of the class, with honors. Valedictorian, Governor General's Award. Treasurer for Student Council.

## Technical Projects

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### Obstacle Avoidance Software for Industrial Robotic Arms – Capstone II

Vancouver, Canada

SOLO: SOFTWARE LEAD

Sept. 2017 - Jan. 2018

- Developing MATLAB simulation of an industrial robot to find the shortest collision-free path between two points.
- Creating a model in MATLAB and Simulink from robot CAD data. The model will be used to plan a trajectory that avoids obstacles and prevent collisions.
- Program will produce the joint variables of the robot needed to follow the path that is produced.

### 3D Printer Hobby Project – Self Sponsored

Vancouver, Canada

ENGINEERING STUDENT

Sept. 2015 - Present

- Designed and built a 3D printer in my spare time. Made CAD models of my designs in SolidWorks.
- Machined parts and assembled the prototype using the lathe, mill, drill press and waterjet cutter available to me.
- Implemented PID control theory on an Arduino for regulating nozzle temperature at 200 °C.