Adam Schonewille

5^{th} Year Engineering Physics

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Skills

Mechanical	Computer	Electrical
· Prototyping and Design	· SolidWorks & AutoDesk Inventor	· Circuit Design and Analysis
· Machining experience with lathe and milling machine	· Trajectory planning algorithms for industrial robots	· Amplifiers, Oscillators and Filters using Transistors
· Structural Mechanics	· Proficiency in MATLAB	· Control-loop Block diagrams
· Mechanical Vibrations analysis	· Impedance control in Simulink	· Signal flow graphs
· Denavit-Hartenberg manipulator convention	· Machine Learning with Linear Regression & Neural Networks	· Root Locus method for designing stable systems
· Direct & Inverse Kinematics	· Programming with C, Java, C++	· Closed-loop PID control
· Robotic Dynamics	· GNU Octave coding	· State–Space Representation
· Euler–Lagrange formulation	· Numerical Integration techniques	· Nyquist stability criterion
· Fluid Dynamics & Heat Transfer	· FEM MATLAB Implementation	· VHDL for FPGAs and ICs

Work Experience

- **NORAM Engineering and Constructors Ltd.** — Vancouver, BC
  Mechanical Engineer Co-op — *May 2017 - Aug. 2017*

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** — Hanover, DE
  Additive Manufacturing Research Position — *May 2016 - Dec. 2016*

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**: Co-author on two manuscripts; see them here and here
- **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 Physics and Chemistry** Vancouver, BC
  Technical Undergraduate Research Assistant *Jan. 2015 – May 2015*

  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.

Projects

- **Obstacle Avoidance for Industrial Robots - Capstone II**: *Sept. 2017 – Present*
  - 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.
- **Thermal Flow Meter - Capstone I**: *Sept. 2016 – May 2017*
  - Developed a flow meter for measuring the flow rate of helium for use in a helium recovery system.
  - Using a thermal TOF simulation and advanced data analysis techniques the velocity of the flow was determined.
  - Gained experience in circuit analysis, debugging, noise reduction techniques, mechanical design, and prototyping.
- **3D Printer Hobby**: *Jan. 2015 – Present*
  - Designed and built a 3D printer in my spare time. Made 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 .
- **Engineering Physics Annual Robotics Competition**: Team website *July 2015 – Aug. 2015*
  - Worked together in a team of 4 to design and prototype a fully functioning autonomous robot in only 6 weeks.
  - Lead Mechanical Engineer: created drawings and SolidWorks models, and machined the majority of components.
  - Analyzed and designed the drive-train components of the robot; specified motor torque requirements and gear-ratios.
  - Applied PID control theory to allow the robot to follow a variable path using feedback from IR reflectance sensors.

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

- **University of British Columbia** Vancouver, BC
  Bachelors of Applied Science in Engineering Physics; Chancellor's Scholar Award. *Sept. 2013 – May 2018*
- **Aldergrove Community Secondary School** Aldergrove, BC
  High school Diploma; Valedictorian, Governor General's Award. *Sept. 2008 – June 2013*

Hobbies and Interests

- Lacrosse, soccer, snowboarding, hiking, and reading/learning

References available upon request