Andrew Cote

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Education

- **University of British Columbia** — Vancouver, BC
  B.A.Sc. in Engineering Physics; GPA: 3.77 — *2013 - 2019 (anticipated)*
- **McGill University** — Montreal, Quebec
  B.A. First Class Honors in Sociology; GPA: 3.85 — *2007 – 2009*

Experience

- **General Fusion** — Vancouver, BC
  Plasma Engineering — *Sept 2017 - Present*
  - **Lithium Treatment**: Researched and designed a method for coating large volume plasma chambers with evaporated lithium to extend plasma lifetimes
  - **Plasma Diagnostics.**: Assisted in development of an improved AXUV Plasma diagnostic using CsI:Tl scintillators and avalanche photodiodes for measuring plasma temperatures
  - **Mechanical Engineering.**: Undertook several design projects to protect and shield plasma diagnostic ports from lithium splashes during high current plasma shots.
- **Control Systems Institute at Technical University of Berlin** — Berlin, Germany
  Software Developer — *May 2017 - August 2017*
  - **Signal Processing**: Developed C++ library of algorithms to handle raw inertial-measurement unit data and perform gait analysis, using sensor fusion to establish and transform between different frames of reference.
  - **Algorithms Design**: Implemented automatic parameter adjustment based on signal characteristics to adapt to different patients, walking speeds, and sensor attachments.
  - **GUI and User Interface**: Interfaced C++ library with my own Python GUI for ease-of-use in importing data, accessing results, fine-tuning thresholds and parameters.
- **TRIUMF Cyclotron** — Vancouver, BC
  RF Engineering — *January 2017 - April 2017*
  - **Mechanical and Electrical Design**: Designed, tested and fabricated a High Voltage RF Transformer for powering a 3 gap accelerating structure with 2-phase 9kV at 11.8MHz; incorporated tunable elements to match impedance and balance EM coupling with pickups for closed loop feedback control.
  - **RF Engineering**: Extensive bench-top testing with Vector Network Analyzers, Amplifiers, Directional Couplers, and weakly coupled pickups to perform stress testing and tune for desired resonance.
  - **Rapid Prototyping**: Combined COMSOL and SPICE circuit simulations with bench-top testing and CNC Machining to quickly iterate through several prototypes over a short time period to meet all project specifications. Installed fully functional RF Transformer on Beamline in April 2017, published results in IPAC 2017 Conference.
- **Pacific Institute of Mathematical Sciences** — Vancouver, BC
  Research Assistant — *June 2016 - August 2016*
  - **Data Analysis and Visualizations**: Developed data science visualization iPython/Jupyter notebooks covering topics in Principal Component Analysis, Machine Learning, and Image Processing.
- **Radio Science Laboratory** — Vancouver, BC
  NSERC Funded Researcher — *May 2015 - April 2016*
  - **Control Systems**: Developed a low-cost ground station antenna with PID controller for tracking LEO satellites. In partnership with MDA and the CASSIOPE / CASPEX research projects.
  - **Wireless Propagation Testing**: Designed and constructed VNA-based channel sounding experiments to determine transmission parameters for microcell modelling, in addition to indoor insertion loss.
  - **LEO Satellite Simulations**: Conducted a simulation campaign using Systems Tool Kit to predict and model orbits of 50 satellites in Low-Earth Orbit with line of sight and accessibility statistics to 10 ground stations.
  - **Statistical Data Analysis**: Developed a software package in MATLAB for data handling and generate statistical summary plots for LEO Simulations data.

- **Laboratory for Atomic Imaging Research** Vancouver, BC
  USRA Research Assistant *May 2014 - August 2014*
  - **Experimental Design**: Characterized acoustic response of two Scanning Tunneling Microscopy rooms, developed experimental procedure for measuring the acoustic-seismic coupling under ambient and excited conditions. Used these results to design acoustic damping system.
  - **LabVIEW DAQ**: Built simple VI's in LabVIEW for recording accelerometer data to characterize performance of acoustic damping system, in addition to automating setup of experimental conditions.

Projects

- **ML Stock Trading and Portfolio Optimization**: Software package in Python using TensorFlow to forecast stock prices and perform portfolio optimization to reduce risk. Trained through backtesting on NYSE data.
- **Autonomous Uber-Bot**: Designed and built over 6 weeks in an intensive robot competition with 3 team mates, an autonomous robot that navigates a model town picking up passengers with a robot arm and navigating to a set drop-off location using IR beacons.
- **IoT Wi-Fi Enabled Volume Measuring device**: Independently designed and tested an UltraSound volume monitoring device that tracks garbage cans fill-level, connecting over WLAN to upload results to a Google Sheet for maintenance optimization.

Awards and Honors

- **Research in Engineering and Science (RISE) Germany**: *MITACS Globalink / DAAD-RISE* **2017**
- **Dean's Honor List**: *UBC Faculty of Applied Science* **2015**
- **Undergraduate Student Research Award (USRA)**: *NSERC* **2015**
- **Science Undergraduate Research Experience Award**: *UBC Dept. of Physics* **2014**
- **Honor's First Class BA**: *McGill University* **2011**

Skills Summary

- **Electrical Engineering**: : RF Engineering, Analog Circuit Design, Control Systems, Signal Processing
- **Prototyping**: : CAD design and modelling, CNC & Manual Machining, 3D printing, integrating electrical, mechanical, and software systems, quickly iterating through new designs for proof-of-principle validation.
- **Software**: : Working Proficiency: Python, C++, MATLAB. Developing Proficiency: LabVIEW, COMSOL, TensorFlow

Publications

- **"Novel RF Structure for Energy Matching into an RFQ."**: V. Zvyagintsec, **A. Cote**, Z. Ang, N. Avreline, T. Au, J. Keir, R.E. Laxdal, M. Marchetto, B. Waraich (2017) *Proceedings of IPAC 2017.*