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## Education

- **University of Waterloo** Waterloo, ON  
*M.A.Sc., Electrical Engineering (Grades: 80%)* *Sep. 2002 - May. 2004*
  - Relevant courses: Semiconductor Devices: Physics and Modelling, Digital VLSI Design, Amorphous Silicon, Mixed-signal modelling with VHDL-AMS
- **University of British Columbia** Vancouver, BC  
*B.A.Sc. Engineering Physics (Electrical Engineering Option)* *1997-2002*
  - Graduated with Honors, **86%** cumulative average, and Dean's Honour List each year.
  - Relevant courses: Solid-state physics, Quantum Mechanics, Semiconductor Devices (BJT, HBT, FET, analog IC layout and simulation), Digital Systems Design using VHDL, Waveguides and Photonics, RF, Analog/Digital Communications Systems, Analog Hardware Design

## Work Experience

- **D-Wave Systems** Vancouver, BC  
*Junior Research Scientist and Software Engineer* *May 2002 - Aug. 2002*
  - Implemented quantum computing algorithms in a JAVA quantum computer simulator, such as quantum Fourier transform, and the quantum eigenvalue finding algorithm.
  - Implemented algorithms for generating Hamiltonians for small molecules.
- **EXI Wireless** Richmond, BC  
*Bluetooth Group Software and Hardware Engineer* *May 2001 - Aug. 2001*
  - Wrote firmware and PC software tools to implement an embedded FLASH/EPROM memory serial programmer for an Atmel Thumb AT91FR4081 processor.
  - Tested, debugged, and fixed Bluetooth development boards with hardware problems.
  - Programmed an embedded serial command interface and memory peak/poke utilities.
  - Integrated EXI's patient monitoring system with Bluetooth wireless networking technology.
- **EXI Wireless** Richmond, BC  
*RFID Tags Group Hardware Engineer* *Sep. 2000 - Dec. 2000*
  - Managed a Bluetooth daughter-board project; created schematics and PCBs using OrCAD.
  - Created an embedded web server demo using a DOS Stamp single-board computer.
  - Designed and implemented an automated RFID Tag Tester. Created schematics and PCB using OrCAD, and programmed GPIB and serial port communication routines in C.
  - Tested RF ID tags using RF equipment (spectrum analyzers, attenuators, TEM cells, antennae).
  - Programmed GPIB data acquisition routines in C for an RFID RF Immunity testing program.
- **Dr. Andre Marziali's Biophysics Lab** UBC  
*NSERC Research Enginner* *May 2000 - Aug. 2000*
  - Developed novel technology for thermal cycling of DNA samples in sub-micro litre volumes.

- Designed mechanical and electrical components for a 384-sample prototype system.
- Wrote control software/drivers in LabVIEW for the gantry robot and plate stacker.
- Built three prototypes for a 384 hole aluminium thermal cycling block.

- **Nortel Networks, OPTera Solutions, Photonic Group** Kanata, ON  
*Research Engineer* *Jan. 1999 - Apr. 1999*
  - Designed a new method of measuring thermal and adiabatic chirp in 1.25/2.5 GHz Lasers. This new method has now been patented by my supervisor Kihong Kim (U.S. patent # 6,178,001).
  - Tested and characterized laser diodes, DWDM filters, and Mach-Zehnder Interferometers
  - Programmed automated DC Laser Testing and Mach-Zehnder Interferometer data acquisition and analysis programs using LabVIEW (over GPIB).
  - Constructed Mach-Zehnder Interferometers using bare fibre spliced together, and characterized them.
  - Was responsible for all lab testing routines involving lasers, filters, and interferometers.

## School Projects

- **SpectraVu Medical** Vancouver, BC  
*Engineering Physics Project Lab, APSC 479* *Sep. 2001 - Apr. 2002*
  - Designed and implemented a digital video processing system for lung cancer imaging,
  - Selected components (video DAC, ADC) and created schematics in OrCAD.
  - Implemented image processing functions and data control blocks in VHDL using an Altera ACEK1K FPGA. Learned VHDL and MAX+PlusII development tool on my own time.
- **Analog Circuit Design and MOSFET Device Design** *Sep. 2001 - Apr. 2002*  
*Semiconductor Devices Course, EECE 480*
  - Designed a high-frequency cascode amplifier, simulated it using HSPICE, and did layout using Cadence Virtuoso Layout software. Manufactured on a Gennum GA911 chip.
  - Designed and simulated a deep sub-micron ( 70 nm channel) MOSFET using MEDICI.
- **Low-cost Optoelectronic Localizer** *Sep. 2000 - Apr. 2001*  
*Engineering Physics Project Lab, APSC 459*
  - Worked on the LoCOL (Low-cost Optoelectronic Localizer) project in a team of three.
  - Programmed a PIC microcontroller to control the timing of the three CCD cameras.
  - Designed power supply and re-built electrical circuits for the CCD sensors, processors.
- **Other Projects** *1999-2000*  
*UBC and at home*
  - Designed and debugged a digital voltmeter using a Motorola 68000 processor.
  - Added features to the digital voltmeter including scrolling text, and a warning buzzer, which won 3rd place in the IEEE Voltmeter Competition.
  - Constructed and debugged a digital clock on a PCB for PHYS 159.
  - Built an AM short-wave radio at home, on a 2" × 2.5" piece of breadboard.

## Awards

Faculty of Engineering Scholarship (\$2,300)	2002
Ontario Graduate Scholarship (OGS) (\$15,000)	2002-2003
Industrial NSERC Undergraduate Research Award (\$4500)	2002
UBC OSI (Outstanding Student Initiative) Entrance Scholarship (\$10,000)	1997-2002
Engineering Physics 50th Anniversary Scholarship (\$600)	2001
Anne. M. Mack Scholarship (\$500)	2001
NSERC Undergraduate Student Research Award (\$4000)	2000
United Food and Commercial Workers Union, Local 1518 Scholarship (\$1000)	1998
Top Senior Math Student Award	1997
B.C. Provincial Exam Scholarship (\$1000)	1997
B.C. Government Passport to Education (\$800)	1997
James Whiteside Elementary Parent Advisory Committee Award (\$200)	1997

## **Skills**

**Languages:** C/C++, L<sup>A</sup>T<sub>E</sub>X, Java, SPICE, MEDICI (TCAD), VHDL/VHDL-AMS, 68000 and PIC Assembly

**Operating Systems:** Linux (Debian), Solaris, UNIX, MacOS X, Windows 95/98/NT/2000/XP

**Applications:** Mathematica, MatLab, GNU Octave, LabVIEW, Cadence, L<sup>A</sup>T<sub>E</sub>X, OpenOffice, MS Office XP, OrCAD schematic capture & PCB layout, Altera MAX+PlusII VHDL FPGA Design

**Lab Skills:** Digital/Analog Scopes, Spectrum Analyzer, Function Generators

**Fab Skills:** PECVD and sputtering deposition, UV lithography, wet etch, dry etch (RIE), mask aligner, step profiler, ellipsometry, infrared spectroscopy, x-ray diffraction

**Miscellaneous:** software configuration management, strong verbal and written communication skills, excellent troubleshooting and debugging skills, exceptional problem solving skills, good teams skills

## **Interests**

**Academic:** Solid state devices, nanotechnology, photonics, microcontrollers, RF/wireless

**Sports:** Playing hockey and swimming

**Computers:** Currently maintain two official Debian Linux packages, Mozilla beta tester, enjoy using and learning Linux systems, Building electronics projects at home, and writing JAVA software

**Musical:** Playing guitar and piano

**Membership:** Student member of IEEE since 1998, Materials Research Society member since 2002

**Other:** Reading novels