Michael I. Gosselin

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CONTACT
INFORMATION

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SKILLS

Computer Skills:
- Git, MATLAB, Embedded C, NX 6.0 SolidWorks, Simulink, LaTeX, OrCAD, Eagle, LabVIEW, Mac OSX, Microsoft Windows, AVR Studio

Electronics Skills:
- 2-layer PCB design, prototyping & fabrication (through hole & surface mount), PCB re-work, Test equipment (i.e. storage oscilloscope), Mixed-signal design, Analog filters & signal conditioning, Power amplification, I^2C, I^2S, MAEVARM M2 (Atmel 32u4)

Machine Skills:
- Waterjet cutter, Laser cutter, Vertical mill, Lathe, MIG welder, Drill press, Band saw

RELEVANT COURSEWORK & PROJECTS

University of Pennsylvania, Philadelphia, PA

Open-Source DAC Project   **January 2013 - Present**
- Conceptualized, prototyped and tested first iteration of a high-performance stereo audio DAC; second interation currently in progress (see portfolio, URL above).
- Designed and selected components for digital side of DAC circuit to comply with Philips I^2S bus standard for PCM audio.
- Used calculation and physical prototyping (solderless breadboards and fast-PCB-fabrication) to design and validate a 2nd order analog active low pass filter with excellent performance in the pass-band.
- Manufactured and populated prototype PCBs with surface mount components, executed testing to confirm bandwidth requirement was met.

PennApps Hackathon: Student Hacker   **January 2013**
- Collaborated with 3 engineering students (ME, EE, CS) to create 2 mobile robots controllable over the internet, designed to shoot darts at one another.
- Over a 48-hour period: conceptualized, designed, tested and debugged motor drive electronics, microcontroller hardware and dart-shooting mechanical hardware.
- Implemented one-way wireless communication using two Atmel 32u4-equipped microntrollers using MAEVARM API and Nordic nRF24LE1 2.4 GHz transceivers.
- Advanced to the finalist group of the top 20 teams (out of 500 competitors).

University of British Columbia, Vancouver, BC, Canada

Senior Mechanical Design Project   **September 2011 to April 2012**
- Collaborated with 4 engineering students (ME, BE) to conceptualize, prototype and refine (3 iterations) a surgical retractor for minimally invasive surgeries.
- Manufactured and tested focused and comprehensive physical prototypes of near-micro scale linkages for deployment and actuation of retractor concepts.
- Interviewed experts and stakeholders (surgeons, administrators, biomedical engineers, reprocessing personnel) to develop a broader understanding of current surgical retraction needs.
- Validated tool performance quantitatively in laparoscopic 'trainer' apparatus and animal lab (porcine) trials, with participation of urology residents and physicians.

PROFESSIONAL
EXPERIENCE

Lazer Zentrum Hannover e.V., Hannover, Niedersachsen, Germany

Laser Microtechnology Group   **September 2009 to December 2009**
Manufacturing Intern

- Experimentally determined optimal laser marking parameters for batch-fabrication of novel thin metal film resistive stain gauges. [1]
- Selected range and scope of experiments to permit sufficient statistical power in analysis of laser marked samples.
- Used nonlinear regression and error analysis of surface measurements of laser markings to build an energy model for marking behavior thin metal films.
- Collaborated with a thin-film deposition company, a professor and a PhD student to apply the thin metal film strain gauge technology to a diesel engine connecting rod for further validation.

RESEARCH
EXPERIENCE

University of Pennsylvania, Philadelphia, PA

GRASP Laboratory - Hpatics Research Group   **September 2012 to Present**
Research Assistant

- Trained 4th-year medical students on SAGES curriculum for peg transfer training task on an Inutitive Surgical daVinci robotic surgery system.
- Implemented automatic capture of force, vibration, and time data using DAC hardware and MATLAB to determine quantitative skills metrics for test subjects.
- Analysed data for 16 subjects, plotted key relationships for surgical skill between groups of subjects.
- Contributed to draft sections of journal article, containing key outcomes from comparisons between groups of subjects.

COMMUNITY
CONTRIBUTIONS

Association de Voluntarios para el Servicio en Areas Protegidas (ASVO)

Volunteer   **May 2012**

- Worked with a team of 20 UBC undergraduates through UBC GoGlobal International Service Learning (ISL) Program. Work included relocating leatherback sea turtle eggs along Costa Rica's Carribean coast, and construction of demonstration farms for introducing novel farming methods to a developing community.

EDUCATION

University of Pennsylvania, Philadelphia, PA, USA

Master of Science in Engineering, Mechanical Engineering and Applied Mechanics
Specialization in Mechatronics   **December 2013**

University of British Columbia, Vancouver, BC, Canada

Bachelor of Applied Science, Mechanical Engineering
Engineering Co-op Program   **May 2011**

PEER-
REVIEWED
PAPERS

[1] Oliver Suttmann, Michael Gosselin, Ulrich Klug and Rainer Kling, "Picosecond laser patterning of NiCr thin film strain gages", Proc. SPIE 7589, 758914 (2010); doi:10.1117/12.840842

AWARDS &
RECOGNITION

PennApps Hackathon: Top 20 Finalist   **January 2013**

GoGlobal International Service Learning Award   **March 2012**

UBC Dean's Honor List   **December 2010**