Eric Wells

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SUMMARY

I am a recent Masters graduate in Mechanical Engineering (focus on prosthetics development) with a diverse skill set built around my passion, robotics. My engineering skills are strengthened by software and hardware capabilities gained in academic and industry settings, as well as through many self-directed projects. I am looking forward to starting a career where I can apply my knowledge and skills to better the situation of individuals and society.

EDUCATION

BSc. Mechanical Engineering
The University of Alberta, Co-op Program
Graduated: 2018 (GPA: 3.9/4.0, branch standing 4th overall)

MSc. Mechanical Engineering
The University of Alberta, Thesis Based
Graduated: 2020 (GPA: 4.0/4.0)

Research Area:
- Improving upper-limb prosthesis performance through enhanced control and feedback strategies.

Thesis Overview:
- Developed a lightweight modular simulated prosthesis with novel compliant grip force sensors. This device is being used in multiple international collaborations.
- Designed a framework and experimental apparatus for testing various myoelectric feedback strategies and used this system to investigate the impact of feedback location on myoelectric performance.

ACADEMIC AWARDS

- Alberta Graduate Excellence Scholarship (2020)
- NSERC Alexander Graham Bell Graduate Scholarship (2019)
- Walter H. Johns Graduate Fellowship (2019)
- 3-Minute-Thesis Finalist (2019)
- 2019 HACKED Hackathon 2nd Place (2019)
- Queen Elizabeth II Graduate Scholarship (2018)
- Louise McKinney Post-Secondary Scholarship (2018)
- University of Alberta Undergraduate Scholarship (2017)
- NSERC Experience Award (2017)
- Schaeffler Group Award for Technical Proficiency and Creativity in Design (2017)

WORK EXPERIENCE

Research Assistant

BLINC Lab – Edmonton, AB (January 2021-Present)
Leading and assisting with applied research in an upper-limb prosthesis lab where computer science, medical, and engineering researchers collaborate to improve robotic prostheses' control and performance.
- Implementing a pattern recognition interface to interpret biosignals in real-time to control various biomedical output devices.
- Prototyping and evaluating a capacitive based wireless force myography wristband to control myoelectric prostheses in real-time using multiple machine learning algorithms.
- Assisting with data collection, data analysis, and manuscript generation for various upper-limb prosthesis experimental studies.

Testing Engineer

Zaber Technologies – Vancouver, BC (January 2017 – September 2017)
Designed automated testing suites to determine specifications for high precision actuators such as backlash, repeatability, and resolution.
- Designed, purchased, and constructed all electrical and software systems required to fully automate a thrust-speed test setup rated up to 1000 lbs using a combination of Python, Arduino, and PID control techniques.

Eric Wells

- Gained hands-on experience of fabrication techniques through independently operating CNC mills, CNC waterjet cutters, laser cutters, and manual lathes.
- Increased knowledge in diagnosing and removing electrical noise and mechanical vibration using Fourier Transforms, oscilloscopes, and electrical shielding techniques.

Control Systems Researcher

University of Alberta – Edmonton, AB (May 2016 – September 2016)

Worked in a control systems lab to implement and document various control techniques on a standardized testbed.

- Designed and constructed both a single and double self-balancing inverted pendulum apparatus to demonstrate and apply different control theory techniques such as PID and LQR controllers.
- Created a customized real-time GUI to monitor all variables corresponding to the pendulum to compare controllers and speed up debugging.

PUBLICATIONS

(Conference Paper) Eric Wells, Shealynn Carpenter, Michael R. Dawson, Ahmed Shehata, Jason Carey, Jacqueline Hebert, "Development of a modular simulated prosthesis and evaluation of a compliant grip force sensor," Myoelectric Controls Symposium, 2020.

(Poster) Eric D. Wells, Ahmed W. Shehata, Jason P. Carey, Jacqueline S. Hebert. Myoelectric Training: Improving Prosthesis Performance Using a Robotic Platform. Poster presented at Spotlight on Innovation; November 7th, 2018; Edmonton, AB.

COMPUTER SKILLS

Preferred Languages:
- Python ●●●●●
- MATLAB ●●●●●
- C++ ●●●●○
- C# ●●●●○
- Java ●●●○○

Operating Systems:
- Windows ●●●●●
- Linux Ubuntu ●●●●○

Solidworks (CSWA I) ●●●●●
Git Version Control ●●●●○
KiCad PCB Design ●●●○○

RECENT PERSONAL PROJECTS

The Advent of Code 2020
- Completing the Advent of Code 2020 programming puzzle series in C++ to increase understanding and familiarity of the language.

Axis Reloaded: Robotic Display (2019)
- Designed a robotic hand to rotate a display platform for the UofA Engineering Open House event using 15 smart servo motors.

Wireless Force Myography Wristband (2019)
- Created a wristband to robustly classify up to 8 different hand and wrist poses by reading pressure signals caused by muscle deformation. These classifications were mapped to a desktop robotic arm to simulate a prosthesis.

Polyvolve: Genetic Algorithm to Recreate Pictures
- Made a genetic algorithm to recreate an image using only semi-transparent polygons, creating unique and artistic results.

Other:
- Visit my website and github (links at top of page) for more information and additional projects.

VOLUNTEERING

- MecE Engineering Capstone Design Judge (2019)
- FIRST Robotics Design Judge (2019-present)
- WISEST Student Mentor (2018-present)
- High school math and physics tutor (2018 – present)

ACTIVITIES AND HOBBIES

- Rock climbing
- Scuba Diving
- Video Editing
- Piano/Guitar