Eric **Wells**

Senior Humanoid Teleoperation Engineer

Vancouver, Canada

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Summary

I am a generalist robotics engineer with a wide range of academic and professional experience covering hardware, software, and the networks that connect them. I have a consistent track record of high performance and am motivated to continue to improve my knowledge. I am eager to enhance my technical expertise, aiming to become a leading contributor in the robotics industry

Education

University of Alberta *Edmonton, Alberta*

BSc. in Mechanical Engineering (3.9/4.0), placement 4th/227 *2013 - 2018*

University of Alberta *Edmonton, Alberta*

MSc. in Mechanical Engineering (4.0/4.0) *2018 - 2020*

- Research Area: Improved 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. Used this system to investigate the impact of feedback location on myoelectric performance.

Honors & Awards

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

Work Experience

Sanctuary AI *Vancouver B.C.*

Senior Humanoid Robotics Teleoperation Engineer *05/2021 - present*

- Led the development of the teleoperation stack for various humanoid robot models, incorporating diverse operator measurement hardware such as motion capture systems and exoskeletons
- Created a kinematic retargeting framework to align human and robot geometries, enabling precise manipulations across humanoid robots of different sizes and shapes.
- Enhanced the operator interface with tactile feedback to improve dexterous manipulation skills.
- Logged over 250 hours operating three generations of humanoid robots in more than 50 live demonstrations, significantly contributing to fundraising efforts, supporting live presentations, documentaries (e.g., Bloomberg), remote operations, data collection, and user acceptance testing.
- Played a pivotal role in the recruitment, onboarding, and mentoring of new team members, growing the team from 2 to 9 members.

BLINC (Bionic Limbs for Improved Natural Control) Lab *Edmonton, A.B.*

Research Assistant *01/2021 - 05/2021*

- Led design and implementation of a general purpose interface to collect electromyography data, train pattern recognition algorithms, display results, and control prosthetic end effectors in real-time.
- Prototyped and evaluated a wireless force myography wristband using capacitive sensors to control myoelectric prostheses in real-time using various pattern recognition algorithms (e.g. SVM, NN).

Zaber Technologies   *Vancouver, B.C.*

Test Engineer   *01/2017 - 09/2017*

- Developed and completed automated test procedures for high precision actuators to determine specifications such as accuracy, backlash, and repeatability with resolution as low as 10 microns.
- 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.
- Gained hands-on experience independently operating CNC mills, CNC waterjet cutters, laser cutters, manual lathes, and many other machining techniques.

University of Alberta   *Edmonton, A.B.*

Control Systems Researcher   *05/2016 - 09/2016*

- Independently 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.

Personal Projects

See ericdavidwells.com/projects for details

Advent of Code   *2020*

- Completed 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 University of Alberta 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 Picturesd   *2019*

- Made a genetic algorithm to recreate an image using only semi-transparent polygons, creating unique and artistic results.

Skills

Programming	C++, Python, MATLAB, ROS2, CMake, DDS, Docker, GStreamer, Git, Gitlab CI/CD, Ansible, C#
Robotics	Teleoperation, Haptic Feedback, Rigid Body Kinematics, Forward/Inverse Kinematics, Networking, Digital Filtering
Operating Systems	Linux/Ubuntu, Windows
Mechanical Design	Solidworks, OnShape, 3D Printing, basic traditional machining (lathe, CNC mill, etc.)
Electrical Design	KiCAD, Oscilloscope diagnostics, basic PCB assembly

Publications

Preliminary Evaluation of the Effect of Mechanotactile Feedback Location on Myoelectric Prosthesis Performance Using a Sensorized Prosthetic Hand   *MDPI Sensors (Journal Paper)*

Eric D. Wells, Ahmed W. Shehata, Michael R. Dawson, Jason P. Carey, Jacqueline S. Hebert   *2022*

Development of a Modular Simulated Prosthesis and Evaluation of a Compliant Grip Force Sensor   *Myoelectric Controls Symposium (Conference Paper)*

Eric Wells, Shealynn Carpenter, Michael R. Dawson, Ahmed Shehata, Jason Carey, Jacqueline Hebert   *2020*

Volunteering

MecE Engineering Capstone Design Judge	*2019*
FIRST Robotics Design Judge	*2019*
WISEST Student Mentor	*2019*
High school math and physics tutor	*2018 - Present*

Extracurriculars

Rock Climbing - lead / bouldering

Piano/Guitar - 10 years of lessons

Scuba Diving - Advanced Certification