

# NATHAN DUARTE

University of Waterloo | Biomedical Engineering

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## SUMMARY

- Contributed to 3 major research projects at Harvard (tissue engineering) and the University of Waterloo (medical imaging)
- Developed a wearable device for real-time monitoring of gait patterns and gained exposure to embedded software systems, signal processing algorithms, and mechanical and hardware design
- Extensive experience leading teams and delivering projects obtained through leading 2 campus-wide organizations

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## EXPERIENCE

### Harvard University

Cambridge, MA

Research Intern

Jan 2018 - Present

- Continuing research from Summer 2017 in collaboration with Harvard Medical School; supervised by Dr. Jennifer Lewis

### Wearable Device for Real-Time Gait Monitoring

Sep 2017 - Dec 2017

- Developed an ankle bracelet to monitor walking patterns and classify cycles as normal walking or freezing of gait
- Extracted features from filtered IMU data; trained and embedded a linear support vector machine for cycle classification
- Integrated Bluetooth Low Energy chips in order to notify external devices via Bluetooth whenever freezing occurs

### University of Waterloo

Waterloo, ON

Undergraduate Researcher

Sep 2017 - Dec 2017

- In a team of 3, developed a microscope which uses AI to achieve nanometre resolution; supervised by Dr. Alex Wong
- Designed and prototyped all mechanical components using SolidWorks; presented work at regular team meetings
- Independently built fiber optic cables for efficient light transport; configured hardware to allow full control with MATLAB

### Harvard University

Cambridge, MA

Research Intern

May 2017 - Aug 2017

- Involved in 2 major tissue engineering projects: 3D printing kidney tissues and developing tissues for implantation
- Designed research and testing methods, analyzed data, and presented findings to 40 graduate students and researchers
- Optimized the tissue-manufacturing protocol resulting in a 47% increase in fabrication success rate

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## EXTRACURRICULAR ACTIVITIES

### UW Biotechnology and Bioengineering Conference

Waterloo, ON

Co-Founder / Co-Director

Nov 2016 - Present

- Initiated the University of Waterloo's first-ever biotech conference in 2017; led a team of 6 to attract 120+ attendees
- Raised over \$10,000 in funding by negotiating partnerships with biotech companies and University organizations
- Secured 12 speakers from industry and academia (ex. Baylis Medical, MIT); currently hiring a team to lead BioTEC 2018

### UW Management Consulting Club

Waterloo, ON

President

Sep 2016 - Present

- Led a team of 9 executives in running 5 major events; engaged 300+ students and increased club membership by 70%
- Partnered with 6 leading firms for the Annual Case Competition; secured 80 delegates and 16 consultant judges
- Facilitated internal club restructuring and streamlined documentation protocols to smoothen term-to-term transitions

### UW NanoRobotics Group

Waterloo, ON

Surface Acoustic Wave (SAW) Team

Oct 2016 - Aug 2017

- Worked in a team of 5 to develop a proof-of-concept for a surface acoustic wave-actuated microrobot
- Optimized various lab procedures used for robot fabrication including the silanization of the robot's glass stage
- Modelled the robot wafer using SolidWorks and ran simulations using basic, self-taught COMSOL Multiphysics skills

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## EDUCATION

### University of Waterloo

Expected Apr 2021

Bachelor of Applied Science (B.A.Sc.) in Biomedical Engineering

GPA: 3.88/4.00

- Elected as Class Representative for the Biomedical Engineering Class of 2021
- Coursework: Statistics, Prototyping and Design, Mechanics of Solids, Data Structures and Algorithms