

# Ryan T. Schroeder, PhD

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## RESEARCH POSITIONS

**Postdoctoral Researcher, Mechanics and Control of Human Movement** **2020-present**  
**Human Performance Lab, Kinesiology, University of Calgary**  
Supervisor: Arthur D Kuo

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## EDUCATION

**Ph.D. Biomedical Engineering, Focus on Biomechanics and Locomotion Science** **2015-2020**  
**Biomedical Engineering Graduate Program, University of Calgary in Alberta, Canada**  
**Ph.D. Exercise and Sports Science, School of Medical and Health Sciences**  
**Edith Cowan University in Perth, Australia**

Thesis: *Gait Entrainment in Coupled Oscillator Systems: Clarifying the Role of Energy Optimization in Human Walking*

Supervisor: John EA Bertram, James L Croft  
(Cumulative GPA: 4.00)

**M.S. Mechanical Engineering, Specialty in Dynamics and Controls** **2013-2014**  
**Howard R. Hughes College of Engineering, University of Nevada, Las Vegas in Nevada, USA**

Thesis: *Designing a Biomimetic Testing Platform for Actuators in a Series-Elastic Co-contraction System*

Supervisor: David V Lee  
(Cumulative GPA: 4.00)

**B.S. Mechanical Engineering and Integrated B.S./M.S. Program** **2010-2013**  
**Howard R. Hughes College of Engineering, University of Nevada, Las Vegas in Nevada, USA**

Undergraduate Research Project: *Extending the Image Processing Capabilities of MATLAB Scripts for X-ray Motion Analysis and Tracking for the Application of Assessing Joint Laxity in Guinea Pig Knees*

Supervisor: David V Lee  
Graduated *Magna Cum Laude* (Cumulative GPA: 3.83)

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## RESEARCH CONTRIBUTIONS

### Peer-Reviewed Publications

1. **Schroeder RT**, Croft JL and Bertram JEA. (2021). Evaluating the energetics of entrainment in a human-machine coupled oscillator system. *Scientific Reports*. 11(15804), doi: 10.1038/s41598-021-95047-x
2. Vial S, Croft JL, **Schroeder RT**, Blazeovich AJ and Wilkie JC. (2020). Does the presence of an opponent affect object projection accuracy in elite athletes? A study of the landing location of the short serve in elite badminton players. *International Journal of Sports Science & Coaching*. 15(3), doi: 10.1177/1747954120915670

3. **Schroeder RT**, Bertram JEA, Nguyen VS, Hac VV and Croft JL. (2019). Load carrying with flexible bamboo poles: Optimization of a coupled oscillator system. *Journal of Experimental Biology*. 222(23), jeb203760. doi: 10.1242/jeb.203760. Altmetric High Attention Score = 124. 98<sup>th</sup> percentile compared to outputs of same age (as of Feb. 18<sup>th</sup>, 2020).
4. Croft JL, **Schroeder RT** and Bertram JEA. (2019). The landscape of movement control in locomotion: Cost, strategy, and solution. *Frontiers in Psychology*. 10(716). doi: 10.3389/fpsyg.2019.00716.
5. Croft JL, **Schroeder RT** and Bertram JEA. (2018). Determinants of optimal leg use strategy: Horizontal to vertical transition in the parkour wall climb. *Journal of Experimental Biology*. jeb.190983. doi: 10.1242/jeb.190983.
6. **Schroeder RT** and Bertram JEA. (2018). Minimally actuated walking: Identifying core challenges to economical legged locomotion reveals novel solutions. *Frontiers in Robotics and AI*. 5(58). doi: 10.3389/frobt.2018.00058.
7. **Schroeder RT** and Bertram JEA. (2018). Properties of traditional bamboo carrying poles have implications for user interactions. *PLoS ONE*. 13(5). doi: 10.1371/journal.pone.0196208.
8. Polet DT, **Schroeder RT** and Bertram JEA. (2017). Reducing gravity takes the bounce out of running. *Journal of Experimental Biology*. 221(3). doi: 10.1242/jeb.162024.
9. Croft JL, **Schroeder RT** and Bertram JEA. (2017). The goal of locomotion: Separating the fundamental task from the mechanisms that accomplish it. *Psychonomic Bulletin and Review*. 24(6), 1675-1685. doi:10.3758/s13423-016-1222-3.

### Manuscripts in Review or in Preparation

1. **Schroeder RT** and Kuo AD (2021). Elastic energy savings and active energy cost in a simple model of running. *PLOS Computational Biology*.
2. **Schroeder RT**, Croft JL and Bertram JEA. (In Preparation). Human walking with a machine coupled oscillator: Sensitivity and limitations to entrainment.
3. Hasaneini SJ, **Schroeder RT**, Ruina A and Bertram JEA. (In Preparation). An optimization model predicts the converse effects of speed and gravity on human walking and running energetics.
4. **Schroeder RT** and Lee DV. (In Preparation). A bioinspired artificial muscle-tendon system as a testing platform to assess actuator technology. *Bioinspiration & Biomimetics*.

### Presentations and Conferences

1. **Schroeder RT** and Kuo AD. Series-elasticity does not eliminate the need for active work in running. 43<sup>rd</sup> Annual Meeting for the American Society of Biomechanics. Virtual conference. Podium Presentation. Aug. 13<sup>th</sup>, 2021.
2. **Schroeder RT** and Kuo AD. A simple model of energy cost for running on slopes. *Dynamic Walking*. Virtual conference. Poster Presentation. Jul. 15<sup>th</sup>, 2021.
3. **Schroeder RT**, Croft JL and Bertram JEA. External power as a proxy for energy cost: Walking entrainment with machine oscillations. *Dynamic Walking*. Virtual conference. Poster Presentation. May 20<sup>th</sup>, 2021.

4. **Schroeder RT** and Kuo AD. Optimal stiffness in the spring-mass model: why should muscles care? *Westcoast Neuromechanics Conference*. Celista, BC Canada. Podium Presentation. Oct. 3<sup>rd</sup>, 2020.
5. **Schroeder RT**, Croft JL and Bertram JEA. Mechanical perturbations make it easier to walk... if you walk the right way. *International Society of Biomechanics*. Calgary, AB Canada. August 3<sup>rd</sup>, 2019.
6. **Schroeder RT**, Croft JL and Bertram JEA. Fight, flight or entrainment: Differential human responses to machine oscillations. *Dynamic Walking*. Canmore, AB Canada. Podium Presentation, June 3<sup>rd</sup>, 2019.
7. **Schroeder RT**, Croft JL and Bertram JEA. Native Bamboo Pole Carriers Employ Locally Optimal Gait Solutions. *Annual Meeting for The Society for Experimental Biology*. Florence, Italy. Podium Presentation, July 2018.
8. **Schroeder RT** and Bertram JEA. Human Gait Adaptation to Machine Force Oscillations. *Dynamic Walking*. Pensacola, Florida. Poster and Video Presentation, May 2018.
9. **Schroeder RT**, Croft JL and Bertram JEA. Parkour Wall Climbing: Simple Physics of an Extreme Task. *The 18<sup>th</sup> Annual Alberta Biomedical Engineering Conference*. Banff, Alberta. Podium Presentation, November 2017.
10. **Schroeder RT**, Croft JL and Bertram JEA. Adapting Gait to Bouncy Loads when Optimal Conditions are Infeasible. *Alberta Motor Control Association Annual Conference*. Jasper, Alberta. Podium Presentation, September 2017.
11. Bertram JEA, Hasaneini SJ, **Schroeder RT** and Ruina A. The Cause of Energetic Cost Differences in Walking and Running: Optimization Modeling and Speed-Gravity Experiments. *Dynamic Walking*. Mariehamn, Finland. Podium Presentation, June 2017.
12. **Schroeder RT**, Croft JL and Bertram JEA. Exploring the Dying Art of Traditional Load Carrying: The Mechanical Properties of Bamboo Farmworker Poles in Vietnam. *The Society for Integrative and Comparative Biology Annual Meeting*. New Orleans, Louisiana. Poster Presentation, January 2017.
13. **Schroeder RT**, Polet DT and Bertram JEA. Human Running Kinematics in Reduced Gravity: Why do we Bounce? *The 17<sup>th</sup> Annual Alberta Biomedical Engineering Conference*. Calgary, AB. Poster Presentation, October 2016.
14. **Schroeder RT** and Bertram JEA. The Influence of Coupled Oscillators in Locomotion: Applying Control Optimization to a Motor Control Problem. *Alberta Motor Control Association Annual Conference*. Kananaskis, AB. Podium Presentation, September 2016.
15. Bertram JEA, Polet DT and **Schroeder RT**. Energetics of Quadrupedal Locomotion: The Impact of Collisions. *The 8<sup>th</sup> International Conference on Canine and Equine Locomotion*. London, England. Poster Presentation, August 2016.
16. Croft JL, **Schroeder RT** and Bertram JEA. Defining the Task is Critical to the Interpretation of Motor Control Strategies. *Australasian Skill Acquisition and Research Group Meeting*. Singapore. Podium Presentation, July 2016.
17. **Schroeder RT** and Bertram JEA. Coupled Oscillators Affect the Energetics of Bipedal Walking: A Tale of Two Models. *The Northwestern Biomechanics Symposium*. Vancouver, BC. Podium Presentation, June 2016.

18. **Schroeder RT** and Bertram JEA. Oscillating Loads Affect Human Walking Energetics: A Tale of Two Models. *The Third Annual McCaig Meeting on Musculoskeletal Disease*. Calgary, AB. Poster Presentation, May 2016.
19. **Schroeder RT**. Inertial Sensors as a Solution to Gait Diagnostics and Evaluation. *The First Xsens Annual User Meeting in North America*. Seattle, WA. Invited Speaker, November 2015.
20. **Schroeder RT**, Bertram JEA and Matyas J. Inertial Sensors as a Gait Assessment Tool: Biomedical Engineering Support of the 2015-16 Veterinary Independent Research Project. *The Sixteenth Annual Alberta Biomedical Engineering Conference*. Banff, AB. Poster Presentation, November 2015.
21. **Schroeder RT** and Lee DV. Piezoelectric Versus Electromagnetic Series-Elastic Actuators for Muscle-Tendon Systems. *Society of Integrative and Comparative Biology*. Austin, TX. Poster Presentation, January 2014.

## Research Grants

1. Matyas J, Bertram JEA and **Schroeder RT**. Zoetis Investment in Innovation Fund. "UCVM Capstone Research Experience in DVM Curriculum: a comparison of 3D inertial sensors and serial force platform systems to evaluate lameness in dogs. (\$34,500). Nov. 2015.

## RESEARCH EXPERIENCE

### Postdoctoral Researcher, Mechanics and Control of Human Movement Human Performance Lab, Kinesiology, University of Calgary

Feb 2020-2021

Primary Investigator: Arthur D Kuo

- Optimization modeling of human locomotion and other relevant biomechanics tasks
- Experiments on human neuromechanics and motor control

### Graduate Research Assistant - Integrated Biomechanics Lab

Jan 2015-2019

Ph.D. Thesis: *Investigating Human-Machine Interactions under the Context of a Coupled Oscillator System during Human Locomotion*

Primary Investigator: John EA Bertram, James L Croft

- Designed and built an experimental exoskeleton device to investigate altered gait patterns in the wearer
- Equipment and instrumentation: Nippon Pulse America linear shaft motors, a MicroE linear optical encoder, an Elmo Motion Control motor driver and associated software, a Landice treadmill, Xsens inertial sensors and a Parvo Medics metabolic measurement system
- Software: MATLAB, SolidWorks and Labview software.
- Graduate level coursework: Fundamentals of Biomedical Engineering and Seminar

Project: *Carrying Oscillating Loads with a Flexible Pole during Human Walking*

Primary Investigator: John Bertram, PhD

- Travelled to Norther Vietnam to investigate gait strategies dealing with load carrying and device interactions
- Equipment and instrumentation: Xsens inertial sensors, a home-made force plate system and GoPro cameras
- Software: MATLAB and Labview software

Project: *Investigating the Effects of Simulated Reduced Gravity on Walking and Running in Humans*

Primary Investigator: Javad Hasnaneini, PhD

- Used a harness apparatus to pull up on subjects with a constant force at walking and running speeds
- Equipment and instrumentation: reduced gravity harness, rotational optical encoders, a custom made tension transducer, a Landice treadmill, Xsens inertial sensors and a Parvo Medics metabolic measurement system
- Software: MATLAB and Labview software

Project: *Using Inertial Sensors as a Gait Diagnostics Tool for Assessing Lameness in Canines*

Primary Investigators: John Matyas, PhD and John Bertram, PhD

- Used inertial sensors to assess lameness (i.e. limping) in midsized dogs trotting down a trackway
- Equipment and instrumentation: Xsens inertial sensors, force plates, an NI data acquisition system and a GoPro Hero Silver
- Software: MATLAB and Labview software

### **Graduate Research Assistant - Lab of Comparative Biomechanics**

**Jun 2013-Dec 2014**

M.S. Thesis: *Designing a Biomimetic Testing Platform for Actuators in a Series-Elastic Co-contraction System*

Primary Investigator: David V. Lee

- Designed and built an artificial muscle-tendon system utilizing principles in biomimetics
- Used the robotic system described to test different actuators for performance parameters
- Equipment and instrumentation: Futek tension and torque transducers, a Makerbot 3D-printer, Pololu electromagnetic motors and associated drivers, DTI ultrasonic piezoelectric rotary motors and associated drivers, and a Vision Research Miro camera
- Software: Labview, SolidWorks and MATLAB software

Project: *Using Mathematical Models to Predict a Parameter Space for Successful Trotting Gaits in Quadruped Robots*

Primary Investigator: Mohamed Trabia, PhD

- Built a mathematical model to simulate trotting in a quadruped robot
- Software: MATLAB

### **Undergraduate Research Assistant - Lab of Comparative Biomechanics**

**Aug 2012-May 2013**

Project: *Enhancing the Image Processing Capabilities of MATLAB Scripts for the Bio-kinematic Analysis of X-ray*

Primary Investigator: David V. Lee

- Utilized algorithms in MATLAB to track platinum markers implanted in guinea pig knees with the goal of assessing joint laxity (i.e. looseness)
- Equipment and instrumentation: X-ray machine
- Software: MATLAB

### **Undergraduate Senior Design Project**

**Aug 2012-May 2013**

Project: *Designing an Ergonomic Climate-Controlled Blanket for Enhanced Comfort in Extreme Climates*

Project Advisor: Hui Zhao

- Designed a fan utilizing Joule heating to push heated air from underneath a bed frame to HVAC outlets embedded into a customized blanket
  - Built a fully-operational prototype
  - Performed thermodynamic analysis for cooling/heating effects on human physiology
  - Software: MATLAB and SolidWorks
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## MEDIA ATTENTION

- CBC Calgary Radio: The Homestretch Radio Show. Live interview about publication in the Journal of Experimental Biology, "Load carrying with flexible bamboo poles: Optimization of a coupled oscillator system," Feb. 2<sup>nd</sup>, 2019. <https://www.cbc.ca/listen/live-radio/1-97-the-homestretch/clip/15760468-bamboo-poles-and-backpacks>.
- "How bamboo sticks help Vietnamese villagers shoulder mighty loads: it's a matter of simple physics" by Isaac Schultz. Jan. 31<sup>st</sup>, 2020. Atlas Obscura. <https://www.atlasobscura.com/articles/vietnam-bamboo-pole-weights>
- "Lasat voelt lichter onder flexibele juk" by Dorine Schenk. Dec. 5<sup>th</sup>, 2019. NRC Handelsblad. <https://www.nrc.nl/nieuws/2019/12/05/last-voelt-lichter-onder-flexibel-juk-a3982821>
- "How springy bamboo poles help villagers carry incredibly heavy loads" by The Company of Biologists. Dec. 5<sup>th</sup>, 2019. SciTech Daily. <https://scitechdaily.com/how-springy-bamboo-poles-help-villagers-carry-incredibly-heavy-loads/>
- "Springy bamboo poles help villagers carry more than their own body weight." Dec. 4<sup>th</sup>, 2019. Long Room. <https://www.longroom.com/discussion/1721285/springy-bamboo-poles-help-villagers-carry-more-than-their-own-body-weight>
- "Bendy bamboo poles really do help people carry more than their own body weight and reduce the forces exerted on their shoulders by almost a FIFTH, study claims" by Milly Vincent. Dec. 4<sup>th</sup>, 2019. Daily Mail. <https://www.dailymail.co.uk/sciencetech/article-7756165/Bendy-bamboo-poles-really-help-people-carry-body-weight.html>
- "Springy bamboo poles help villagers carry more than their own body weight" by The Company of Biologists. Dec. 4<sup>th</sup>, 2019. Phys Org. <https://phys.org/news/2019-12-springy-bamboo-poles-villagers-body.html>
- "Springy bamboo poles help villagers carry more than their own body weight" by Kathryn Knight. Dec. 4<sup>th</sup>, 2019. Journal of Experimental Biology, Inside JEB. 222(23), jeb216721. doi: 10.1242/jeb.216721
- "How parkour enthusiasts scramble up walls" by Kathryn Knight. Jan. 10<sup>th</sup>, 2019. Journal of Experimental Biology, Inside JEB. 222(1), jeb196592. doi: 10.1242/jeb.196592
- "One giant step for a man" by Kathryn Knight. Feb. 13<sup>th</sup>, 2018. Journal of Experimental Biology, Inside JEB. 221(3), jeb176073. doi: 10.1242/jeb.176073

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## AWARDS AND HONORS

- Eyes High International Doctoral Scholarship, Faculty of Graduate Studies, (\$15,000 CAD), 2019
- Nominated for Teaching Excellence Award, Faculty of Kinesiology, University of Calgary, 2019
- Biomedical Engineering Research Award (\$5,000 CAD), 2019
- Eyes High Doctoral Recruitment Scholarship (\$30,000 CAD/year), 2015-2018
- "Best Highlight Video" Award, Dynamic Walking Conference, 2018
- Endeavour Research Fellowship for collaboration with Edith Cowan University (\$24,500 AUD), 2017
- "Best PhD Podium Presentation," Northwestern Biomechanics Symposium (\$200 USD), 2016
- Exchange Grant for Research Abroad (\$1,981.37 CAD), 2016
- Biomedical Engineering Equipment Grant (\$5,000 CAD), 2015
- "Most Creative Poster," Southern Alberta Biomedical Engineering Conference (\$175 CAD), 2015
- Biomedical Engineering Recruitment Prize (\$5,000 CAD), 2015

- Nevada NASA Consortium Fellowship (\$13,000 USD), 2013-2014
  - “Teaching Assistant of the Year” award for the department of Mechanical Engineering, 2013-2014
  - NSF-EPSCoR Undergraduate Research Scholarship (\$4,750 USD), 2013
  - Graduated Magna Cum Laude, 2013
  - Dean’s List for High Class Standings, 2010-2013
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## **LEADERSHIP AND COMMUNITY INVOLVEMENT**

### ***Professional Societies, Honor Societies and Volunteer Work***

#### **Innovation 4 Health Competition: Surgery and Recovery (2017)**

Foothills Hospital Campus, University of Calgary in Alberta, Canada

Description: This was a university-endorsed hackathon event intended to bring researchers of different backgrounds together to tackle difficult problems relevant to clinicians and other health care professionals. I volunteered to help organize and guide the events leading up to the competition.

#### **Bow River Trash Pick-Up Day (2016)**

Biomedical Engineering at the University of Calgary in Alberta, Canada

Description: This was a volunteer event within the department of Biomedical Engineering. As part of a larger effort to help clean up trash around the city, our department was tasked with picking up trash near Glenmore Reservoir and near the Bow River.

#### **Brain Day (2016)**

Monsignor J. J. O'Brien Elementary School in Alberta, Canada

Description: This is an annual volunteer event that I participated in. It is focused on teaching grade five children about the brain and the importance of wearing a helmet for safety purposes.

#### **High School Cadaver Anatomy Labs (2015-2016)**

The University of Calgary in Alberta, Canada

Description: Twice a year, high school classes come to tour the cadaver anatomy labs and facilities at the university. I have helped with multiple of these lab sessions by engaging the high school students with the opportunity to gain hands-on experience with real-world biology. Not only does this include teaching the anatomy, but also students gain much from conversing with graduate students about career choices and options available to them. This form of abbreviated mentorship can be very impactful on a student’s future choices in their education and their career.

#### **Stephen’s Backpacks (2015, 2017, 2018)**

A private organization in Alberta, Canada

Description: This unique charity was started by an autistic child when, nine years ago, he realized that homeless youth existed in his city. He decided to help them by attaining backpacks and filling them with Christmas toys, goods and supplies. Today the organization helps thousands of homeless of people each year through their generosity. It has been an honor to dedicate even a small slice of my time to help this organization better our community.

#### **ASME The American Society of Mechanical Engineers (2011-2013)**

The University of Nevada, Las Vegas in Nevada, USA

Description: I was involved with this society during my undergraduate studies. As a member, I helped to organize multiple projects in the community as well as social events to encourage networking and engagement amongst engineering students at the University of Nevada, Las Vegas.

#### **Phi Kappa Phi (2012-2013)**

The University of Nevada, Las Vegas in Nevada, USA

Description: This is an honors society that is focused on the roles of leadership within the community as well as academia. Being a member of this group has ensured that I have helped to organize fundraisers and networking events.

### **Tau Beta Pi (2012-2013)**

The University of Nevada, Las Vegas in Nevada, USA

Description: This is an honors society for engineers and scientists. My role in this group was to help maintain memberships as well as interview new members for enlistment. The group also held events for peers and colleagues to meet and discuss ideas for furthering the ideals of academia and science in society.

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## **TEACHING EXPERIENCE**

### **Teaching Assistant**

**2015-2019**

Department: Schulich School of Engineering, the University of Calgary, Calgary in Alberta, Canada

Course: Engineering Statics (ENGG 202)

- Developed online homework assignments for 900+ students enrolled in the course
- Provided email support for students with questions about the assignments
- Extensively worked with assessment software such as Mastering Engineering by Pearson and WileyPLUS by Wiley
- Invigilated exams

### **Tutorial Instructor**

**2017-2018**

Department: Faculty of Kinesiology, the University of Calgary, Calgary in Alberta, Canada

Course: Biomechanics of Biological Materials (KNES 363)

- Led weekly tutorials with approximately 15-20 students per session
- Developed content for tutorials on fundamental principals in biomechanics
- Marking exams

### **Teaching Assistant**

**2016**

Department: Faculty of Kinesiology, the University of Calgary, Calgary in Alberta, Canada

Course: Introduction to Research in Kinesiology (KNES 213)

- Marked assignments on topics of fundamental research methods in study design, analysis and critical appraisal of scientific literature for approximately 150 students

### **Technical Advisor and Research Mentor**

**2015-2016**

Department: Faculty of Veterinary Medicine, the University of Calgary in Alberta, Canada

Course: Professional Skills III: Integrated Research Project (VETM 507)

- Created podcast videos explaining theoretical engineering concepts and techniques such as the following: kinematics, dynamics, instrumentation, data collection and analysis techniques
- Provided technical assistance in setting up and conducting experiments
- Mentored students on data analysis techniques and signal processing

### **High School Cadaver Anatomy Labs**

**2015-2016**

Department: Biology and Anatomy, the University of Calgary in Alberta, Canada

- Helped teach cadaver anatomy to high school students
- Abbreviated form of mentorship to speak with the students about academic/career goals

### **Laboratory Instructor**

**2015**

Department: Biomedical Engineering Graduate Program, the University of Calgary in Alberta, Canada

Course: Anatomy for Biomedical Engineers (BMEN 609)

- Performed administrative tasks involved with the course

- Taught a laboratory of approximately 10 students about the physiology of aerobic/anaerobic respiration using a Parvo Medics metabolic measurement system

**Workshop on Computational Methods in Neuroscience****2015**

Department: Neuroscience, the University of Lethbridge in Alberta, Canada

- Assisted my colleague (Javad Hasnaneini, PhD) in conducting a workshop of approximately 30 students utilizing MATLAB as a tool to perform control optimization on dynamic systems
- Aided students during the workshop and helping to answer questions

**Laboratory Instructor****2013-2014**

Department: Mechanical Engineering, the University of Nevada, Las Vegas in Nevada, USA

Course: Fluid Dynamics (ME 380)

- Instructed six three-hour-long bi-weekly labs of approximately 25 students on fundamental principals in fluid mechanics
- Graded extensive lab reports considering both theoretical and experimental techniques in problems relevant to fluid mechanics

**Tutor at the Tutoring center****2013-2014**

Department: College of Engineering, the University of Nevada, Las Vegas in Nevada, USA

Course: Engineering Statics (CEE 241) and Dynamics (ME 242)

- Spent six hours a week tutoring undergraduate students with questions about fundamental engineering concepts and techniques such as full-body diagrams, kinematics and force-balance equations

**MENTEES/TRAINEES**

**2021:** Kieran Roberts, Undergraduate Research Project, Mechanical Engineering, Biomedical Engineering Specialization, University of Calgary

**2021:** Karson Fitzsimons, Master's Student at the University of Calgary

**2020:** Andrei Noskov, Summer Research Student, Undergraduate in Engineering Science, Robotics Engineering, University of Toronto

**2020:** Claire Wamboldt, Summer Research Student, Undergraduate in Psychology, McGill University

**2019:** Kieran Roberts, Summer Research Student, Undergraduate in Mechanical Engineering, Biomedical Engineering Specialization, University of Calgary

**2015-2018:** Jaehoon Kim, Undergraduate Honours Thesis in Biomedical Sciences, University of Calgary: "Energetic Consequences of Asymmetrical Gait in Non-pathological Human Walking"

**2015-2018:** Jorge Zapote, Summer Research Student, Undergraduate Research in Mechanical Engineering, University of Calgary

**2017:** Fatima Saleem, High School Summer Research Program, "Video Analysis of Parkour Wall Climb"

**2017:** Obayd Shams, High School Summer Research Program, "Video Analysis of Parkour Wall Climb"

**2016:** Carlos Vargas, Mechanical Engineering Master's Student on Research Exchange from Pontifical Catholic University of Peru, at the University of Calgary

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**2015-2016:** Trina Hancock – Capstone Project in Veterinary Medicine, University of Calgary: “A comparison of Xsens inertial sensors to force plates for detection of mild, experimentally-induced lameness in healthy dogs”

**2015-2016:** Blythe Sola – Capstone Project in Veterinary Medicine, University of Calgary: “A comparison of Xsens inertial sensors to force plates for detection of mild, experimentally-induced lameness in healthy dogs”

**2015-2016:** Meryam Shillingford – Capstone Project in Veterinary Medicine, University of Calgary: “A comparison of Xsens inertial sensors to force plates for detection of mild, experimentally-induced lameness in healthy dogs”

**2015-2016:** Kelsey Chapman – Capstone Project in Veterinary Medicine, University of Calgary: “A comparison of Xsens inertial sensors to force plates for detection of mild, experimentally-induced lameness in healthy dogs”

**2015-2016:** Mary Zhou – Capstone Project in Veterinary Medicine, University of Calgary: “A comparison of Xsens inertial sensors to force plates for detection of mild, experimentally-induced lameness in healthy dogs”

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## **CONFERENCES AND MEETINGS ATTENDED**

- American Society of Biomechanics, August 2021, Virtual
- Dynamic Walking, May/July 2021, International Conference, Virtual
- Westcoast Neuromechanics Conference, October 2020, Celista, BC Canada
- Dynamic Walking, June 2020, Canmore, AB Canada
- International Society of Biomechanics, August 2019, Calgary, AB Canada
- Dynamic Walking, June 2019, Canmore, AB Canada
- Society of Experimental Biology, July 2018, Florence, Italy
- Dynamic Walking, May 2018, Pensacola, FL USA
- The Alberta Biomedical Engineering Conference, November 2017, Banff, AB Canada
- 48<sup>th</sup> Alberta Motor Control Association Annual Conference, September 2017, Jasper, AB Canada
- Dynamic Walking, June 2017, Mariehamn, Finland
- The Society for Integrative and Comparative Biology Annual Meeting, January 2017, New Orleans, Louisiana USA
- The Alberta Biomedical Engineering Conference, October 2016, Banff, AB Canada
- 47<sup>th</sup> Alberta Motor Control Association Annual Conference, September 2016, Kananaskis, AB Canada
- 8<sup>th</sup> International Conference on Canine and Equine Locomotion, August 2016, London, England
- 9<sup>th</sup> Australasian Skill Acquisition and Research Group Meeting, July 2016, Singapore
- Northwestern Biomechanics Symposium, June 2016, Vancouver, BC Canada
- 3<sup>rd</sup> Annual McCaig Meeting on Musculoskeletal Disease, May 2016, Calgary, AB Canada
- 1<sup>st</sup> Xsens Annual User Meeting in North America, November 2015, Seattle, WA USA
- Southern Alberta Biomedical Engineering Conference, November 2015, Banff, AB Canada
- Society for Integrative and Comparative Biology, January 2014, Austin, TX USA