

University of Calgary

14th Annual Biomedical Engineering Undergraduate Summer Research Symposium

August 19st, 9:00AM – 12:45PM over Zoom

Thank you for participating in the 14th Biomedical Engineering Undergraduate Summer Research Symposium! The Biomedical Engineering Summer Symposium is an opportunity for undergraduate students to showcase their summer work, practice their presentation skills, and learn about the exciting biomedical research being conducted at the University of Calgary.

Many of the student presenters have received awards allowing them to participate in academic research, and their presentations cover a range of topics including biomechanics, imaging, wearables, computational models, sensors, and signal processing.

Presentation are 6 minutes with 2 minutes for questions. [View Abstract Submissions](#)

There are three concurrent zoom sessions, red, green, and blue. You are free to move between sessions at any time. **The green session will act as the main session.**

9:00-9:10	Introduction and Welcome Zoom Link Password: 014762		
9:10-10:00	Medical Imaging Zoom Link Password: 480493	Sensors, Signals, and Computational Models	Biomechanics Zoom Link Password: 355607
10:00-10:10	Break		
10:10-11:10	Medical Imaging	Sensors, Signals, and Computational Models	Biomechanics
11:30-12:30	Grad Student Panel		
12:30-12:45	Presentation of Awards		

Acknowledgments: Thank you to the BME Graduate Program and BMEG for their help in organizing this event. Special thanks to Dr. Herzog for sponsoring award prizes. Thank you also to the graduate and undergraduate volunteers, session chairs and judges.



Event Sponsored By:

Biomedical Engineering Graduate Program



UNIVERSITY OF CALGARY
Biomedical Engineering Graduate Program

Prizes Sponsored By: Dr. Walter Herzog

SESSION: Medical Imaging

Judges: Carina Butterworth & Alejandro Gutiérrez

Moderator: Danielle Whittier

9:10 – *An Exploratory Study of Bone Quality in Females Suffering from Selected Autoimmune Diseases using HR-pQCT.*

Presenter: Rachel Klassen

Supervisor: Dr. Steven Boyd

9:18 – *Comparing 2D and 3D AC Electrothermal Device Models*

Presenter: Graciela Moscoso

Supervisor: Dr. Colin Dalton

9:26 – *Monitoring Breast Treatment with Microwaves: Consistency of Scans of the Healthy Breast*

Presenter: Patricia Sharleen

Supervisor: Dr. Elise Fear

9:34 – *Validating Periosteal and Endosteal Localization in the Femur of Clinical Computed Tomography Datasets*

Presenter: Aleena Abid

Supervisor: Dr. Steven Boyd

9:42 – *An Open-Source Visualization Tool for Analysis of HR-pQCT Images of the Human Knee*

Presenter: Isabella Vandergaag

Supervisor: Dr. Steven Boyd

9:50 – *Validation of bone density and microarchitecture measurements in the human knee obtained using HR-pQCT*

Presenter: Christopher Keen

Supervisor: Dr. Steven Boyd

9:58 – *Do hip fracture patients experience asymmetrical bone loss after fracture?*

Presenter: Rachel DiMaio

Supervisor: Dr. Steven Boyd

10:00 – 10:10 BREAK

10:10 – *Validation of phantom-less calibration for CT muscle analysis*

Presenter: Ainsley Smith

Supervisor: Dr. Sarah Manske

10:18 – *Tibial Stress Fractures: A Literature Review of Site-Specific Occurrences*

Presenter: Becca Page

Supervisor: Dr. Brent Edwards

10:26 – *Tissue and Cell Segmentation in Lightsheet Microscopy Images using Deep Learning*

Presenter: Samuel Robertson

Supervisor: Dr. Nils Forkert

10:34 – *Individualization of neural subnetworks during early childhood*

Presenter: Stella Heo

Supervisor: Dr. Signe Bray

10:42 – *Spectral dynamic causal model to examine functional connectivity between visual word form area and frontoparietal network*

Presenter: Sonja Cotra

Supervisor: Dr. Catherine Lebel

10:50 – *Detection and Typing of Renal Amyloidosis by Spectroscopy Using the Microenvironmentally Sensitive Fluorophore K114*

Presenter: Paula Brandt

Supervisor: Dr. Daniel Muruve

11:30 – 12:30 GRAD STUDENT PANNEL

12:30 – 12:45 PRESENTATION OF AWARD

SESSION: Biomechanics

Judges: Rachel Sondergaard & Thomas

Lijnse

Moderator: Tiffany Dang

9:10 – *Take-Off in the Parkour Wall Run Maneuver*

Presenter: Claire Wamboldt

Supervisor: Dr. John Bertram

9:18 – *Cartilage Mechanobiological Response during Cyclic Dynamic Loading*

Presenter: Darius Ramrattan

Supervisor: Dr. Baaba S. Otoo

9:26 – *In-Vivo Assessment of Intraluminal Thrombus Thickness as Aid for Rupture Risk Elimination in Abdominal Aortic Aneurysms*

Presenter: Elize Tran

Supervisor: Dr. Elena Di Martino

9:34 – *The Mechanical Properties of Intervertebral Discs in Rabbits after Botulinum Toxin Type-A Injection*

Presenter: Emmanuel Fikre

Supervisor: Dr. John Bertram

9:42 – *Utilizing Center of Pressure Analytics to Investigate Neuromotor Control Strategies*

Presenter: Karson Fitzsimons

Supervisor: Dr. John Bertram

9:50 – *Categorization of Structure-based Constitutive Models for Aortic Wall Tissue under Planar Biaxial Tension*

Presenter: Caleb Tong

Supervisor: Dr. Elena Di Martino

9:58 – *Vertebral Bone Microarchitecture After Injection of Botulinum Toxin into the Paraspinal Muscles*

Presenter: Ty Moline

Supervisor: Dr. Walter Herzog

10:10 – *Effect of Axillary Crutch Length on Triceps Activation During Swing-Through Gait*

Presenter: Monica Russel

Supervisor: Dr. Ranita Harpreet Kaur Manocha

10:18 – *The effect of Botox injections in the paraspinal muscles on the morphology of the intervertebral discs in rabbits*

Presenter: Muzammil Nasir

Supervisor: Dr. Walter Herzog

10:26 – *Biomechanical Properties of the Intervertebral Discs in Pre- and Post- Menopausal Women*

Presenter: Manmeet Dhiman

Supervisor: Dr. Neil Duncan

10:34 – *Using Digital Image Correlation Techniques to Evaluate Local Tissue Strain of Isolated Medial Gastrocnemius Aponeuroses in Rabbits*

Presenter: Jeff Ilg

Supervisor: Dr. Walter Herzog

10:42 – *The Impact of Femoral Nerve Block and Neuromuscular Stimulation on the Quadriceps Muscle in Rabbits: A Pilot Study*

Presenter: Faizan Syed

Supervisor: Dr. Venus Joumaa

10:50 – *The Mechanical Properties of Intervertebral Discs in Rabbits after Botulinum Toxin Type-A Injection*

Presenter: Chris Tiessen

Supervisor: Dr. Walter Herzog

11:30 – 12:30 GRAD STUDENT PANNEL

12:30 – 12:45 PRESENTATION OF AWARDS

10:00 – 10:10 BREAK

**SESSION: Sensors, Signals, and
Computational Models**

Judges: Bryce Besler, & Michael

Kuczynski

Moderator: Katrin Smith

**9:10 – Autism Spectrum Disorder and Wearable
Technology: Validation of a Health Gauge Watch**

Presenter: Janelle Wai

Supervisor: Dr. Jane Shearer

**9:18 – Telekinesis in Technology: Using Brain-
Computer Interface for Power Mobility**

Presenter: James Chen

Supervisor: Dr. Ephrem Zewdie

**9:26 – Utilizing Brain Computer Interface for iPad
Control**

Presenter: Mitali Pradhan

Supervisor: Dr. Ephrem Zewdie

**9:34 – Benefits of Cyclist Green Wave Systems using
Wearables**

Presenter: Tyler Yip

Supervisor: Dr. Reed Ferber

**9:42 – Internal consistency of sway measures from a
head-mounted accelerometer in healthy controls**

Presenter: Jessica Ritchie

Supervisor: Dr. Jeffery Dunn

**9:50 – OpenFOAM Multiphysics Simulation
Comparison to Commercial Software for
Electrokinetic Fluid Flow of Conductive Biofluids in
Microchannels**

Presenter: Stirling Cenaiko

Supervisor: Dr. Colin Dalton

**9:58 – Electroencephalography-based functional
connectivity demonstrates global alpha
desynchronization during balance**

Presenter: Steven Jiang

Supervisor: Dr. Jeffery Dunn

10:00 – 10:10 BREAK

**10:10 – Using wearable technology to investigate
soccer players' movement patterns during 180-
degree change of direction manoeuvres: a study
protocol**

Presenter: James Baysic

Supervisor: Dr. Kati Pasanen

**10:18 – Using Brain Computer Interface (BCI) for
Robotic Painting**

Presenter: Raziq Kassam

Supervisor: Dr. Ephrem Zewdie

**10:26 – Assessing Microelectrode Simulation
Techniques**

Presenter: Lisa Van de Panne

Supervisor: Dr. Colin Dalton

**10:34 – Assessing postural stability using wearable
technology in youth soccer players**

Presenter: Benjamin Leggett

Supervisor: Dr. Kati Pasanen

**10:42 – A review of negative pressure ventilation in
the context of a COVID-19 ventilator shortfall**

Presenter: Sophia Lu

Supervisor: Dr. Mark Ungrin

**10:50 – Simulating the Effects of Uniform Electric
Field in Promoting Peripheral Simulating the Effects
of Uniform Electric Field in Promoting Peripheral
Nerve Injury Regeneration**

Presenter: Harshit Sharma

Supervisor: Dr. Kartikeya Murari

**10:58 – Development of a multifunctional electrical
cuff intended for peripheral nerve monitoring and
regeneration.**

Presenter: Alec Lamb

Supervisor: Dr. Colin Dalton

11:30 – 12:30 GRAD STUDENT PANNEL

12:30 – 12:45 PRESENTATION OF AWARDS