

# Matthew James Slopecki

Ph.D. Candidate / Research Assistant



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A self-driven individual (shown through management of multiple professional and academic projects) who thrives working as part of a larger, multi-disciplinary team in a fast-paced environment, reflected through work and research in elite sports science.



## Skills

Inertial measurement units (**Xsens Dot**, Xsens MVN, Physiolog)

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Excellent

3D motion capture systems (**VICON**, Cortex)

■ ■ ■ ■ ■  
Excellent

Force plates (**AMTI**, Kistler, PASCO)

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Excellent

Isokinetic Dynamometers (Cybex, Biodex)

■ ■ ■ ■ ■  
Excellent

Electromyography (surface and intramuscular) systems (**Delsys Trigno**)

■ ■ ■ ■ ■  
Excellent

**Scholarship & grant application writing**

■ ■ ■ ■ ■  
Excellent

**Management of academic funds**

■ ■ ■ ■ ■  
Excellent



## Software

**Python** (PyCharm, Anaconda, Matplotlib, TKinter GUI, device I/O, Numpy, Jupyter)

■ ■ ■ ■ ■  
Excellent

**MATLAB**

■ ■ ■ ■ ■  
Excellent

Statistical Software (**R Studio**, IBM SPSS)

■ ■ ■ ■ ■  
Excellent

Office Suites (Microsoft, Google, Apple)

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Motion Capture ( <b>VICON Nexus</b> , Cortex, Biomechzoo)	<div> <div>Excellent</div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> </div>
<b>Data Visualization</b> (MATLAB, R, <a href="#">R Shiny</a> , Matplotlib, Seaborn)	<div> <div>Excellent</div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> </div>
<b>Version Control</b> ( <b>GitHub</b> )	<div> <div>Excellent</div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> </div>
<b>Machine Learning</b> (Keras, Tensorflow)	<div> <div>Good</div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> </div>
Database ( <b>SQL</b> , MySQL)	<div> <div>Good</div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> </div>



## Work History

2024-05 – Current

### Gameday Operator

*Portable, Montréal, Quebec*

- Pre-game set up and calibration of portable performance monitoring system in Canadian Football League stadiums.
- Live tagging of events during Canadian Football League games.
- Pitchside quality assurance of the data acquisition pipeline (sensor, player, receiver, data acquisition computer).

2020-10 – Current

### Research Assistant

*Institut national du sport du Québec, Montréal, Quebec*

- Contributing to Integrated Support Team (IST) strategic planning meetings for the Canadian Paralympic swimming high performance team.
- Providing biomechanical services twice a week using video and IMU based analyses with the paralympic swimming team.
- Developed performance testing application **utilized by Team Canada athletes** (Short-Track Speed Skating, Para-swimming, Water Polo, Diving and numerous other athletes).
  - Continued development of an IMU based **MATLAB** algorithm and development of MATLAB based **GUI** to provide in-water performance analyses for Paralympic swimmers (2022/05 – Present).
  - Developed a custom force plate testing application with GUI in **Python**. Native integration of AMTI forceplates for data collection, analyses, data storage and report generation for pool of 100+ athletes. Ability to analyze 3<sup>rd</sup> party collected datasets (2022/05 - 2023/01).
  - Data science/programming role to innovate in-house **MATLAB** application for athlete force plate testing (improving UI and code integration with databases) (2020/10 - 2021/12).
- Implemented **version control** for projects using GitHub.

2020-01 – 2020-12

## Teaching Assistant

McGill University, Montréal, Canada

- **Lecturing, grading, and administration** of EDKP 444 – Ergonomics (Fall 2020); EDKP 208 – Biomechanics and Motor Control (Winter 2020).
- Recorded grades for coursework and tests in online reporting system.

2019-11 - 2020-08

## Research Assistant

Institut national du sport du Québec, Montréal, Quebec

- Aided PI with **IMU data collection** for national team water polo athletes.
- **Data processing** for water polo machine learning project.

2020-01 - 2020-04

## Grader

McGill University, Montréal, Canada

- **Grading assignments** for EDKP 433 – Research Methods

2017-07 - 2018-06

## Biomechanics Intern

Sports Surgery Clinic, Dublin, Ireland

- 1-year Biomechanics internship in a **3D motion capture lab** focused on ACL, Groin and Shoulder rehabilitation, performance testing and research.
- Tested patients, ranging from **amateur to world-class field sport athletes**.
- Experience: 350+ hours of experience using a 12-camera (**VICON**) 3d optical motion capture lab with AMTI force plates.
- Extensive experience performing a range of isokinetic dynamometry tests; including knee, ankle, and shoulder movements.
- Developed proficiency in processing data in VICON Nexus and MATLAB, developing novel, custom-written codes when necessary for academic research use.



## Education

2020-09 - Current

## Ph.D.: Kinesiology Sciences

McGill University - Montreal, QC

- Received **Mitacs accelerate doctoral fellowship** 2022 - 25 (funded by Swimming Canada). Developing an IMU based solution for automated performance monitoring and fatigue related movement pattern analyses in paralympic swimmers.
- Received **Fonds de Recherche du Québec (Santé) doctoral training scholarship** 2022 - 26. Using complex motor variability analyses to understand the effects of fatigue and personal factors on upper-limb repetitive movement patterns.
- Awarded international fee waiver (merit based) 2021 - 22.

- Elected to Vice President of Academics for Kinesiology and Physical Education graduate students' association in 2021 - 22.
- Elected to Vice President of Communication for Kinesiology and Physical Education graduate students' association in 2020 - 21.

2019-09 - 2020-08

## Master of Science: Biomechanics And Neuroscience

McGill University - Montreal, QC

- **Fast-tracked into Kinesiology Sciences Ph.D.** program after first year of M.Sc.

2015-09 - 2019-08

## Bachelor of Science (Honours): Sports, Health and Exercise Sciences

Brunel University London - London, UK

- **Specialization in Human Performance.**
- Completed **1-year internship in Biomechanics** at the Sports Surgery Clinic.

### Other courses

- Quebec Scientific Entrepreneurship program - V1 Studio (03/2024)
- Tensorflow develop certificate bootcamp – Udemy (01/2024)
- R shiny interactive Web Apps – Udemy (10/2023)
- MySQL bootcamp – Udemy (05/2022)
- GUI development with Python and Tkinter – Udemy (05/2022)
- Python for data science and machine learning bootcamp – Udemy (10/2020)



## Publications

**Slopecki, M.,** Charbonneau, M., Deguire, S., Côté, J. N., Clément, J. (In Review). Technical performance analyses in elite Paralympic swimming using wearable technology: A case series. *Submitted to Sports Biomechanics.*

**Slopecki, M.,** Clément, J., Charbonneau, M., Côté, J. N. (2024). Impact of Limb Symmetry on Stroke-to-Stroke Movement Variability in Para-Swimmers During an Adapted Aerobic Step Test. *ISBS Proceedings Archive*, 42(1), 862. <https://commons.nmu.edu/isbs/vol42/iss1/49/>

**Slopecki, M.,** Charbonneau, M., Lavallière, J.M., Côté, J. N., Clément, J. (2024). Validation of Automatically Quantified Swim Stroke Mechanics Using an Inertial Measurement Unit in Paralympic Athletes. *Bioengineering* 11(1). <https://doi.org/10.3390/bioengineering11010015>

Bailey, C., Hasanbarani, F., **Slopecki, M.,** Yang, C., Côté, J. N. (2023). Size and structure of motor variability in young and old adults performing a rhythmic, repetitive tapping task. *Journal of Biomechanics* 152: 111595. <https://doi.org/10.1016/j.jbiomech.2023.111595>

**Slopecki, M.,** Hasanbarani, F., Yang, C., Bailey, C., Côté, J. N. (2022). Uncontrolled manifold analysis of the effects of different fatigue locations on kinematic coordination during a repetitive upper-limb task. *Motor Control* 26(4): 713-728. <https://doi.org/10.1123/mc.2021-0114>

Hasanbarani, F., Yang, C., Bailey, C. A., **Slopecki, M.**, & Cote, J. N. (2021). Sex-specific effects of a repetitive fatiguing task on stability: Analysis with Motor Equivalence model. *Journal of Biomechanics*, 110769. <https://doi.org/10.1016/j.jbiomech.2021.110769>

**Slopecki, M.**, Messing, K., & Côté, J. N. (2020). Is sex a proxy for mechanical variables during an upper limb repetitive movement task? An investigation of the effects of sex and of anthropometric load on muscle fatigue. *Biology of sex differences*, 11(1). <https://doi.org/10.1186/s13293-020-00336-1>



## Publications (In Progress)

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**Slopecki, M.**, Spagnuolo, L., Yang, D., Chang, T., Côté, J. N. (In Progress). *Sex differences in the effect of self-selected rest duration during fatiguing, repeated cycle ergometer bouts*. Target journal: *Journal of Sports Sciences*.

**Slopecki, M.**, Fanning, C., Daniels, K., Kung, S. (In Progress). *Biomechanical upper-extremity joint position sense tests in collision and contact athletes*. No journal/anticipated submission date currently.



## Conference and Symposium Oral Presentations

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**Slopecki, M.**, Clément, J., Charbonneau, M., Côté, J. N. (2024). Impact of Limb Symmetry on Stroke-to-Stroke Movement Variability in Para-Swimmers During an Adapted Aerobic Step Test. Oral Presentation (2 minutes) at the International Society of Biomechanics in Sports Conference, Salzburg, Austria.

**Slopecki, M.**, Charbonneau, M., Lavallière, J.M., Clément, J., Côté, J. N. (2024). *IMU based analyses of Paralympic swimming: Validation and implementation of the solution*. Oral Presentation (15 minutes) at The Medical and Scientific Engineering Behind Performance, Institut national du sport du Québec – Montréal, Canada.

**Slopecki, M.**, Charbonneau, M., Lavallière, J.M., Côté, J. N., Clément, J. (2024). *IMU based analyses of Paralympic swimmers: Validation to applications*. Oral Presentation (10 minutes) at the mid-year symposium for the International Society of Biomechanics in Sports. Online.

**Slopecki, M.**, Charbonneau, M., Lavallière, J.M., Côté, J. N., Clément, J. (2023). *IMU-based motor variability metrics in para-swimming*. Oral presentation (3 minutes) at The Medical and Scientific Engineering Behind Performance, Institut national du sport du Québec – Montréal, Canada.

**Slopecki, M.** (2022) *The effect of different fatigue locations on repetitive pointing task performance: What novel information can we gain from uncontrolled manifold analyses?* Oral presentation (15 minutes) at the International Society of Electrophysiology and Kinesiology 2022 Congress, Quebec City, Canada.

**Slopecki, M.**, Hasanbarani, F., Bailey, C., Yang, C., Côté, J. N. (2021). *Uncontrolled manifold analysis of effects of different fatigue locations on coordination during a repetitive pointing task*. Oral

presentation (10 minutes) at the 12th Symposium on Motor Control at the 28th Congress of the International Society of Biomechanics, Stockholm, Sweden (Online).

Bailey, C., Hasanbarani, F., **Slopecki, M.**, Yang, C., Côté, J. N. (2021). *Size and structure of joint angle variability in young and old adults performing a fatiguing repetitive reaching task*. Oral presentation at 28th Congress of the International Society of Biomechanics, Stockholm, Sweden (Online).

**Slopecki, M.** (2021). *Motor Variability of the Shoulder: Advanced Metrics*. Oral presentation (10 minutes) at the 1st Virtual Symposium on Upper Limb Fatigue. Montreal, Canada (Online).



## Conference Poster Presentations

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**Slopecki, M.**, Clément, J., Charbonneau, M., Côté, J. N. (2024). *Impact of Limb Symmetry on Stroke-to-Stroke Movement Variability in Para-Swimmers During an Adapted Aerobic Step Test*. Poster Presentation at the International Society of Biomechanics in Sports Conference, Salzburg, Austria.

Spagnuolo, P. L., Huaman, J.M., Lamanuzzi, S., **Slopecki, M.**, Côté, J. N. (2023). *Sex Differences in Muscle Fatigue among USports Rowers during a 2000m Time Trial*. Poster presentation at the 18th Annual Sport Innovation Summit, Halifax, Canada.

**Slopecki, M.**, Charbonneau, M., Lavallière, J.M., Clément, J., Côté, J. N. (2023). *Movement irregularity and complexity changes in Paralympic swimmers completing an adapted aerobic step test*. Poster presented at the 18th annual Sport Innovation Summit, Halifax, Canada.

**Slopecki, M.**, Charbonneau, M., Lavallière, J.M., Côté, J. N., Clément, J. (2022). *IMU based monitoring of performance and fatigue in para-swimming*. Poster presented at the 17th annual Sport Innovation Summit, Vancouver, Canada.

**Slopecki, M.**, Bailey, C., Côté, J. N. (2022). *Old males show reduced motor flexibility during a seated, fatiguing, repetitive reaching task*. Poster presented at the North American Congress of Biomechanics, Ottawa, Canada.

Hasanbarani, F., Yang, C., Bailey, C., **Slopecki, M.**, Côté, J. N. (2021). *Sex differences and fatiguing movement effects on task-specific stability*. Poster presented at 28th Congress of the International Society of Biomechanics, Stockholm, Sweden (Online).

**Slopecki, M.**, Côté, J. N. (2021). *Conventional measures overestimate sex differences in kinematics during fatiguing upper-limb repetitive pointing*. Poster presented at 21st Biennial Meeting of Canadian Society of Biomechanics, Montreal, Canada (Online).

**Slopecki, M.**, Côté, J. N. (2020). *Interaction effect of anthropometric load and sex on the progression of fatigue during an upper limb repetitive movement task*. Poster accepted for presentation to 11th Annual International Conference of Applied Human Factors and Ergonomics (Online), San Diego, USA.

**Slopecki, M.,** Daniels, K., Fanning, E., Falvey, E. (2018, September). *The role of torque in shoulder joint position sense*. Poster presented at Royal College of Surgeons Ireland – Return to Play: The Shoulder, Dublin, Ireland. <http://dx.doi.org/10.13140/RG.2.2.20175.82083>



## Lectures

- Wearables and Machine Learning (EDKP 566: Advanced Biomechanics Theory, McGill University; 10/2022)
- Continuous Relative Phase: Introductory Lecture (SP2801: Biomechanics of Human Movement, Brunel University London; 11/2021)
- Biomechanics in Ergonomics Lecture (EDKP 444: Ergonomics, McGill University; 11/2020)
- Linear and Angular Kinematics (EDKP 208: Motor Control, McGill University; 11/2020)



## Other Presentations

- Prospective Student Webinar (McGill University – Department of Kinesiology and Physical Education) (11/2021)
- Student Perspectives Panel (McGill University - Research Methods EDKP 605) (11/2021)
- Center for Interdisciplinary Research in Rehabilitation – Talking Research series: “Is sex a proxy for anthropometric variables during fatiguing, upper-limb repetitive movement: What researchers and clinicians should know” (10/2020)



## Accomplishments

### **Academic Funding (Received: \$330,920 | Declined: \$14,000)**

#### **Fellowships and Scholarships (Received: \$210,000):**

- Mitacs Accelerate Doctoral Fellowship – 2022-2025 (Received: \$120,000)
- Fonds de Recherche Québec (Santé) – Doctoral Training Scholarship 2022-2026 (Received: \$84,000)
- Canadian Institutes of Health Research (CIHR) Team for Gender Considerations in Knowledge Transfer Interventions – Scholarship For Knowledge Sharing 2020 (\$6,000)

#### **Awards (Received: \$51,020):**

- 2<sup>nd</sup> Place in New Investigator Award – International Society of Biomechanics in Sports 2024 (\$300)
- MSK Network Conference Travel Award 2022 (\$1000)
- McGill University GREAT Travel Award 2022 (\$320)
- Canadian Society of Biomechanics (CSB) NACOB Travel Award 2022 (\$300)
- McGill University Department of Education Graduate Student Society (EGSS) – Professional and Research Development Award 2021 (75CAD to cover excess workshop costs at ISB 2021)
- International Society of Biomechanics Motor Control Group – ISB Sponsored Motor Control Group Student Award 2021 (250USD ≈ 310\$)
- International Society of Biomechanics (ISB) – International Travel Grant 2021 (Fully Funded Conference)
- McGill University Department of Kinesiology and Physical Education – Differential Fee Waiver 2021-22 (Removal of International Tuition Fees)



- McGill University Graduate & Postdoctoral Studies – Virtual Mobility Award 2021 (\$350)
- McGill University Postgraduate Students Society Travel Award 2021 (\$190)
- Mitacs GlobalLink Research Award Abroad 2021 (\$6,000; Declined due to COVID-19 pandemic)
- McGill University Graduate Excellence Award 2020 – 2023 (\$12,400 per annum)
- McGill University Graduate Excellence Award 2020 (\$1,000)
- McGill University GREAT Travel Award 2020 (\$250)
- REPAR Travel Award - Support for Students for Presentation in Scientific Events 2019-2020 (\$500)
- McGill University Department of Kinesiology and Physical Education Recruitment Award 2019 - 2020 (\$3,000)

#### **Stipends (Received: \$57,300 | Declined: \$14,000):**

- Research Stipend from Dr. Julie N. Côté's Natural Sciences and Engineering Research Council of Canada Grant 2021 - 2022 (\$7,600)
- Research Stipend from Dr. Julie N. Côté's McGill Sports Science Research Grant 2020 - 2021 (\$10,000)
- Research Stipend from Dr. Julie N. Côté's Natural Sciences and Engineering Research Council of Canada Grant 2020 – 2021 (\$11,600)
- Research Stipend from Dr. Julie N. Côté's Natural Sciences and Engineering Research Council of Canada Grant 2020-2021 (Declined \$14,000)
- Research Stipend from Dr. Julie N. Côté's Natural Sciences and Engineering Research Council of Canada Grant 2019-2020 (\$6,500)



## Service Experience

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- **Independent reviewer** for Applied Ergonomics, Current Research in Physiology, Journal of Biomechanics, International Society of Biomechanics in Sports Archive.
- **Conference organizing committee member** - Minds in Motion 2022 (Department of Kinesiology and Physical Education, McGill University).
- **Hiring Committees** – Nominated student representative on hiring committee for Applied Biomechanics Professor (Department of Kinesiology and Physical Education, McGill University).



## Mentorship

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- Undergraduate Students: **16-week summer internship** in BOS laboratory. Funded by **NSERC USRA** program



## Affiliations

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- **International Society of Biomechanics in Sports (Student Member)** – 01/2022 - Present
- **Sport Scientist Canada (Student Member)** – 02/2021 - Present
- **International Society of Biomechanics (Student Member)** - 12/2020 – Present
- **Quebec Rehabilitation Research Network (Student Member)** - 09/2019 – Present
- **Center for Interdisciplinary Research in Rehabilitation (Student Member)** - 12/2019 – Present
- **Canadian Institutes of Health Research - MSK Network (Student Member)** - 12/2019 – Present