

# Matthew James Slopecki Ph.D.

Research Assistant



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Self-driven professional with experience managing multiple academic and applied projects, thriving in fast-paced, multidisciplinary environments, reflected through work and research in elite sports science.



## Skills

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

■ ■ ■ ■ ■  
Excellent

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

■ ■ ■ ■ ■  
Excellent

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

■ ■ ■ ■ ■  
Excellent

Isokinetic Dynamometers (Cybex, Biodex)

■ ■ ■ ■ ■  
Excellent

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

■ ■ ■ ■ ■  
Excellent

**Scholarship & grant application writing**

■ ■ ■ ■ ■  
Excellent

**Management of project funds**

■ ■ ■ ■ ■  
Excellent



## Software

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

■ ■ ■ ■ ■  
Excellent

**MATLAB**

■ ■ ■ ■ ■  
Excellent

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

■ ■ ■ ■ ■  
Excellent

Office Suites (Microsoft, Google, Apple)

■ ■ ■ ■ ■  
Excellent

Motion Capture (**VICON Nexus**, Cortex, Biomechzoo)

■ ■ ■ ■ ■  
Excellent

**Data Visualization** (MATLAB, R, R Shiny, Matplotlib, Seaborn)

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Excellent

Version Control (GitHub)

Excellent

JavaScript

Good

Machine Learning and Artificial Intelligence (Keras, Tensorflow)

Good

Database (SQL, MySQL)

Good



## Work History

2025/10 – Present

### Research Associate

Department of Kinesiology, McGill University, Montréal, Canada & School of Human Kinetics University of Ottawa, Canada

- Contributor to Dr. Julie N. Côté's **Canada Research Chair – Tier 1** and **Canadian Fund for Innovation - John R. Evans Leaders Fund** grant applications.
- Lead researcher on **data validation** projects alongside graduate students of BOS lab.
- Innovated and adapted biomechanics data collection and analysis procedures to optimally facilitate collaborations with researchers at other universities, including University of Ottawa.
- Developed two internal teaching courses for BOS lab students ("ABC of Kinematics" & "SPM1D 101").
- Oversaw ethics compliance of all research projects conducted in laboratory.

2025/04 – 2025/05

### Sports Science Consultant

- Provided consultation on biomechanical methods to advance a swimming coach's competencies in athlete profiling interventions.

2025/04 – 2025/05

### Research Assistant – Biomechanics of Occupation and Sports Laboratory

McGill University, Montréal, Canada

- Developed **MATLAB** application to create a user-friendly pipeline for kinematic data analyses (3-d motion capture of upper- and lower-limb).
- Led grant writing (co-applicant) for McGill SASSI Sports Science Grant.
- Taught and mentored M.Sc. student in research study design (IMU and EMG) for in-water swimming analyses.

2020/10 – 2025/05

### Research Assistant

Institut national du sport du Québec, Montréal, Quebec

- Contributed to Integrated Support Team (IST) strategic planning meetings for the Canadian Paralympic swimming high performance team.
- Provided wearable and video-based biomechanical services twice a week with Canadian Paralympic swimming high performance team.
- Developed performance testing applications **utilized by Team Canada athletes** (Short-Track Speed Skating, Para-swimming, Canoe/Kayak, Water Polo, Diving and numerous other athletes).

- Development of a performance analysis **GUI (R Shiny)** that imports and analyses on-water Video, IMU and power-meter sensor data from Canoes and Kayaks (2025/04 – 2025/05).
- Development of an IMU based **MATLAB** algorithm and development of MATLAB based **GUI** to provide in-water performance analyses for Paralympic swimmers (2022/05 – 2025/05).
- 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.

2024/05 – 2024/10

### Gameday Operator

*Sportable, 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).

2020/01 – 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 – 2025/05

### Ph.D. in Kinesiology Sciences

*McGill University - Montreal, QC*

- Published 8 peer-reviewed journal articles (6 first author; 1 additional first author manuscripts submitted and 1 manuscript close to submission).
- Presented 17 conference projects (1 x 1<sup>st</sup> place student award (ISB); 1 x 2<sup>nd</sup> place new investigator award (ISBS)).
- Awarded **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.
- Awarded **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 in 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) in 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 developer 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 – Udemy (10/2020)



## Publications

Spagnuolo, L., Huaman, J. M., Lamanuzzi, S., **Slopecki, M.**, Côté J.N. (Submitted). Sex differences in muscular and cardiovascular manifestations of fatigue during a 2000m rowing time trial. *Submitted to International Journal of Sports Physiology and Performance*

**Slopecki, M.**, Daniels, K., Kung, S., Fanning, C. (Submitted). Open and closed-chain joint position sense: inter-day reliability and normative profiles. *Submitted to Journal of Sports Rehabilitation*.

**Slopecki, M.**, Clément, J., Charbonneau, M., Côté. J. N. (2025). Measuring the impact of limb asymmetry on movement irregularity and complexity changes during an incremental step test in para-swimmers using inertial measurement units. *Sensors*, 25(11). <https://doi.org/10.3390/s25113297>

**Slopecki, M.**, Charbonneau, M., Deguire, S., Côté. J. N., Clément, J. (2025). Technical performance analyses in elite Paralympic swimming using wearable technology: Two case studies. *Sports Biomechanics*. <https://doi.org/10.1080/14763141.2025.2508239>

**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:10.3390/bioengineering11010015> (**Editor's Choice**)

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.2021.11076>

**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)

**Slopecki, M.**, Therrien, A., Clément, J., Charbonneau, M., Côté. J. N. (In Progress). Validation of inertial-measurement-unit-derived scapula kinematics during swimming. *Target journal: Human Movement Science*.

**Slopecki, M.**, Therrien, A., Clément, J., Charbonneau, M., Côté. J. N. (In Progress). Fatigue-related changes in wearable-derived swimming mechanics in collegiate swimmers. *Target journal: Sports Biomechanics*.

Therrien, A., **Slopecki, M.**, Clément, J., Charbonneau, M., Côté, J. N. (In Progress). Measuring the impact of fatigue on scapula kinematics using in-water measures. *Target journal: Journal of Biomechanics*.

**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*.



## Conference and Symposium Oral Presentations

**Slopecki, M.**, Clément, J., Côté, J. N., Charbonneau, M. (2025). In-competition wearable data collection: An example from Para-swimming. Oral Presentation (15 minutes) at the Sport Innovation Summit, Calgary, Canada.

**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). **Winner of Motor Control Group Student Award.**

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

Soulas, A., Charbonneau, M., **Slopecki, M.**, Deguire, S., Côté, J. N., Clément, J., (2024). Modelling para-swimmers' performance using multiple linear regression on inertial measurement variables. Poster Presentation at the Tanenbaum Institute of Sports Sciences Conference, Toronto, Canada.

**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. **2<sup>nd</sup> Place – New Investigator Award.**

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). *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)



## Courses

- Statistical Parametric Mapping 101: 1-hour course developed as part of McGill's Department of Education's "Loop Lab" initiative. Provides introductory theory and practical experience using statistical parametric mapping on timeseries data.



## Accomplishments

### **Academic Funding (Received: \$320,065 | Declined: \$20,000)**

#### **Fellowships and Scholarships (Received: \$222,000):**

- Mitacs Accelerate Doctoral Fellowship – 2022-2025 (\$120,000)
- Fonds de Recherche Québec (Santé) – Doctoral Training Scholarship 2022-2026 (\$96,000)
- Canadian Institutes of Health Research (CIHR) Team for Gender Considerations in Knowledge Transfer Interventions – Scholarship for Knowledge Sharing 2020 (\$6,000)

#### **Awards (Received: \$62,695 | Declined: \$6,000):**

- McGill University Department of Education's "Loop Lab" (\$2500)
- 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 (\$75 to cover workshop costs at ISB 2021)
- International Society of Biomechanics Motor Control Group – ISB Sponsored Motor Control Group Student Award 2021 (\$310)
- International Society of Biomechanics (ISB) – International Travel Grant 2021 (Conference Registration Fee; \$400 equivalent value)
- McGill University Department of Kinesiology and Physical Education – Differential Fee Waiver 2021-22 (Removal of International Tuition Fees; \$15,000 equivalent value)
- 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: \$35,370 | 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

- **Independent reviewer** for Applied Ergonomics, Sports Biomechanics, Journal of Sports Sciences, Journal of Biomechanics, Current Research in Physiology, 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

### Masters Students:

- Araya Therrien (2024-25) – Helped to develop thesis project, including advice and feedback on grant and proposal writing, as well as advice on best practices for data collection, processing and statistical modelling.
- Luke Spagnuolo (2022-2024) – Helped to pilot and refine thesis project, including advice on best practices for data processing.

### Undergraduate Students:

- Monica Lubczynski (2022) - **16-week summer internship** in BOS laboratory. Funded by **NSERC USRA** program. Oversaw completion of multiple projects related to Paralympic swimming IMU data collection methods.



## Affiliations

- **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