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., reflected through work and research in elite sports science.

Skills

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

Version Control (**GitHub**)	Excellent
JavaScript	Excellent
Machine Learning and Artifical Intelligence (Keras, Tensorflow)	Good
Database (**SQL**, MySQL)	Good
	Good

Work History

2025/10 – Present

Research Associate – Biomechanics of Occupation and Sports Laboratory

McGill University, Montréal, Canada & University of Ottawa, Canada

- Contributor to Dr. Julie N. Côté's **Canada Research Chair – Tier 2** 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 3rd 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 1st place student award (ISB); 1 x 2nd 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

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

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. **2nd 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, 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)

Courses

- Statistical Parametric Mapping 101: 1-hour course developed as part of McGill's Department of Education's "Loop Lab" initative. 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)
- 2nd 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