Jennifer Bertrand, PhD

Experimental HCI Researcher | Perception, Movement and Multimodal Interaction

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Lille, France | Returning to Canada in early 2027

ACADEMIC AND RESEARCH APPOINTMENTS

Postdoctoral Researcher - Experimental HCI and Multimodal Interaction **Oct. 2025 - Present**

CNRS / CRIStAL, University of Lille *Lille, France*

Research focus: Eye-hand coordination and multimodal feedback across direct-touch, haptic, virtual reality, augmented reality, and large-display interfaces.

Alberta Innovates Digital Health Innovation Postdoctoral Fellow **Feb. 2024 - Sept. 2025**

Department of Medicine, University of Alberta *Edmonton, Canada*

Research focus: Markerless motion capture, wearable sensing, and user-centred digital health assessment for older adults and people with chronic disease.

Graduate Researcher - Perception, Movement and Human-Computer Interaction **Sept. 2015 - Oct. 2023**

Actions in Complex Environments Laboratory, University of Alberta *Edmonton, Canada*

Research focus: Visual perception, decision-making, eye-hand coordination, and online interaction using eye tracking, motion capture, EEG, cursor tracking, and touchscreen input.

EDUCATION

PhD, Neuroscience and Kinesiology (Interdisciplinary) | University of Alberta **2017 - 2023**

MSc, Kinesiology | University of Alberta **2015 - 2017**

BSc, Kinesiology | University of Alberta **2010 - 2015**

RESEARCH AREAS AND METHODS

Research expertise: Cognitive science; visual perception; psychophysics; perception-action; eye-hand coordination; human movement and biomechanics; HCI; haptics; digital health

Study design and methods: Experimental design; laboratory, remote, browser-based, and crowdsourced human-subject research; protocol development and piloting

Sensing and systems: Laboratory and webcam eye tracking; optical and markerless motion capture; EEG; wearables; multimodal sensor integration; VR/AR/MR; touchscreen and haptic systems

Data and analysis: Advanced statistical modelling; time-series and signal analysis; data quality and validation; reproducible analysis pipelines; data visualization

PEER REVIEWED PUBLICATIONS

Bertrand, J. K., McNeely, M. L., Bates, J., Joy, J., Kanani, J., Ezeugwu, V. E., & Tandon, P. (2026). Validation of a markerless motion capture app for automated scoring of sit-to-stand, timed up and go, and short physical performance battery tests in adults with chronic disease. *PLOS Digital Health*, 5(1), e0001172. doi: 10.1371/journal.pdig.0001172

Omkar, A., **Bertrand, J. K.**, Sadasivan, C., Osness, E., Vandermeer, B., Ding, X., Dennett, L., Mansour, J., Ezeugwu, V. E., Hyde, A., & Tandon, P. (2026). Behaviour change techniques in eHealth interventions for older, frail, or sarcopenic adults: A systematic review and meta-analysis. *Digital Health*, 12, 20552076261473804. doi: 10.1177/20552076261473804

Osness, E., Isley, S., **Bertrand, J. K.**, Dennett, L., Bates, J., Van Decker, N., Stanhope, A., Omkar, A., Dolgoy, N., Ezeugwu, V. E., & Tandon, P. (2025). Markerless motion capture parameters associated with fall risk or frailty: A scoping review. *Sensors*, 25(18), 5741. doi: 10.3390/s25185741

Ouellette Zuk, A. A., **Bertrand, J. K.**, & Chapman, C. S. (2025). Continuous measures of decision-difficulty captured remotely: Mouse-tracking sensitivity extends to tablets and smartphones. *Computers in Human Behavior*, 162, 108450. doi: 10.1016/j.chb.2024.108450

Bertrand, J. K., & Chapman, C. S. (2023). Dynamics of eye-hand coordination are flexibly preserved in eye-cursor coordination during an online, digital object-interaction task. *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, Article 130, 1-13. doi: 10.1145/3544548.3580866

Ma, H., **Bertrand, J. K.**, Chapman, C. S., & Hayward, D. (2023). You read my mind: Generating and minimizing intention uncertainty under different social contexts in a two-player online game. *Journal of Experimental Psychology: Human Perception and Performance*, 49(10), 1330-1344. doi: 10.1037/xhp0001150

Wispinski, N. J., Stone, S. A., **Bertrand, J. K.**, Ouellette Zuk, A. A., Lavoie, E. B., Gallivan, J. P., & Chapman, C. S. (2021). Reaching for the known unknowns: Rapid reach decisions accurately reflect the future state of dynamic probabilistic information. *Cortex*, 138, 253-265. doi: 10.1016/j.cortex.2021.02.010

Bertrand, J. K., Ouellette Zuk, A. A., & Chapman, C. S. (2019). Clarifying frequency-dependent brightness enhancement: Delta- and theta-band flicker, not alpha-band flicker, consistently seen as brightest. *Experimental Brain Research*, 237, 2061-2073. doi: 10.1007/s00221-019-05568-1

Bertrand, J. K., Wispinski, N. J., Mathewson, K. E., & Chapman, C. S. (2018). Entrainment of theta, not alpha, oscillations is predictive of the brightness of a flickering stimulus. *Scientific Reports*, 8, 6152. doi: 10.1038/s41598-018-24215-3

Lavoie, E. B., **Bertrand, J. K.**, Stone, S. A., Wispinski, N. J., Sawalha, J., & Chapman, C. S. (2018). Examining the 'species' of situated cognition in humans: Commentary on 'Cognition beyond representation: Varieties of situated cognition in animals.' *Comparative Cognition & Behavior Reviews*, 13, 31-34. doi: 10.3819/CCBR.2018.130004

PREPRINT

Bertrand, J. K., Ouellette Zuk, A. A., & Chapman, C. S. (2024). Continuous measures of decision-difficulty captured remotely: II. Webcam eye-tracking reveals early decision processing. *bioRxiv.* doi: 10.1101/2023.06.06.543799

RESEARCH PRESENTATIONS

Talks

Bertrand, J. K., & Tandon, P. (2024). Multidimensional frailty assessment in Parkinson's disease. Lunch-and-learn presentation to the Parkinson and Movement Disorders Program, Kaye Edmonton Clinic, University of Alberta and Alberta Health Services, Edmonton, Canada.

Bertrand, J. K., Stone, S. A., & Chapman, C. S. (2023). Moving and seeing beyond the laboratory: Quantitative UX methods informed by vision and movement neuroscience. Quant UX Conference (international, virtual). Talk.

Bertrand, J. K., & Chapman, C. S. (2023). Dynamics of eye-hand coordination are flexibly preserved in eye-cursor coordination during an online, digital object-interaction task. ACM CHI Conference on Human Factors in Computing Systems, Hamburg, Germany. Paper presentation.

Bertrand, J. K., & Stiegelmar, C. (2020). Developing novel measurement and assessment tools for beyond the research setting. Sensory Motor Adaptive Rehabilitative Technology Network Talk Series, Edmonton, Canada. Virtual talk.

Chapman, C. S., **Bertrand, J. K.**, & Wispinski, N. J. (2017). The influence of non-conscious processing on human decision making. Association for the Scientific Study of Consciousness Conference, Beijing, China. Talk presented by Chapman.

Bertrand, J. K., Wispinski, N. J., Singhal, A., Mathewson, K. E., & Chapman, C. S. (2016). Effects of flicker rate on brightness perception. Prairies Perception Action Cognition Team Conference, Canmore, Canada. Talk.

Posters

Bertrand, J. K., Wilson, J., Bates, J., Omkar, A., Shaikh, T., McNeely, M., & Tandon, P. (2025). Multidimensional frailty in cirrhosis: Objective insights from a digital frailty evaluation app. 21st Annual Division of Gastroenterology Research Day, University of Alberta, Edmonton, Canada. Poster.

Bertrand, J. K., Wilson, J., Bates, J., Joy, J., McNeely, M., & Tandon, P. (2025). Validation of markerless motion capture for digital frailty assessment in 228 adults with chronic disease, including chronic liver disease. 21st Annual Division of Gastroenterology Research Day, University of Alberta, Edmonton, Canada. Poster.

Bertrand, J. K., & Chapman, C. S. (2022). Dynamics of eye-hand coordination are flexibly preserved in eye-mouse coordination during an online, screen-based interaction task. Society for Neuroscience, San Diego, USA. Poster.

Bertrand, J. K., Chouinard, B., Fyshe, A., & Chapman, C. S. (2020). What are the consequences of simplifying a sensorimotor task for translation to the clinic? Neuroscience and Mental Health Institute Research Day, Edmonton, Canada. Poster.

Bertrand, J. K., Ouellette Zuk, A. A., Wispinski, N. J., Mathewson, K. E., & Chapman, C. S. (2019). Clarifying theta's role in the brightness enhancement of a flickering stimulus. Neuroscience and Mental Health Institute Research Day, Edmonton, Canada. Poster.

Bertrand, J. K., Ouellette Zuk, A. A., Wispinski, N. J., Mathewson, K. E., & Chapman, C. S. (2018). Clarifying theta's role in the brightness enhancement of a flickering stimulus. Society for Neuroscience, San Diego, USA. Poster.

Bertrand, J. K., Wispinski, N. J., Mathewson, K. E., & Chapman, C. S. (2017). Are neural oscillations responsible for the enhancement of flicker brightness? Psychonomic Society 58th Annual Meeting, Vancouver, Canada. Poster.

Bertrand, J. K., Wispinski, N. J., Mathewson, K. E., & Chapman, C. S. (2017). Are neural oscillations responsible for the misperception of flicker brightness? International Conference for Cognitive Neuroscience, Amsterdam, Netherlands. Poster.

Bertrand, J. K., Wispinski, N. J., Mathewson, K. E., & Chapman, C. S. (2017). Are neural oscillations responsible for the misperception of flicker brightness? Banff Annual Seminar in Cognitive Science, Banff, Canada. Poster.

Bertrand, J. K., Wispinski, N. J., Mathewson, K. E., & Chapman, C. S. (2017). Biasing visual perception decisions with frequency of flashing lights. Alberta Gambling Research Institute Conference, Banff, Canada. Poster.

Bertrand, J. K., Wispinski, N. J., Mathewson, K. E., Singhal, A., & Chapman, C. S. (2016). Brain waves and decision-making: Discrimination decisions and naturally occurring alpha oscillations. RECON IV Graduate Student Conference, Canmore, Canada. Poster.

Bertrand, J. K., Wispinski, N. J., Cormier, D. L., Singhal, A., Mathewson, K. E., & Chapman, C. S. (2016). Discrimination of brightness biased by flicker rate in the alpha frequency range. Society for Neuroscience, San Diego, USA. Poster.

FUNDING AND AWARDS

Best Poster | 21st Annual Division of Gastroenterology Research Day, University of Alberta	**2025**
Alberta Innovates Digital Health Innovation Postdoctoral Fellowship Grant ($60,000)	**2024 - 2025**
SIGCHI Gary Marsden Travel Award for CHI 2023 ($2,500 USD)	**2023**
MITACS Accelerate International Internship Funding ($45,000)	**2021 - 2022**
Best Poster | Neuroscience and Mental Health Research Day, University of Alberta	**2020**
SMART Network Innovation Fund Scholarship ($25,000)	**2020**
Queen Elizabeth II Graduate Scholarship ($15,000)	**2017 - 2018**
Faculty of Graduate Studies and Research Travel Award ($2,000)	**2018**
Graduate Students' Association Academic Travel Grant ($500)	**2018**
Faculty of Kinesiology, Sport and Recreation Travel Grant ($500)	**2018**
Alberta Graduate Student Scholarship ($3,000)	**2017**
Alberta Gambling Research Institute Graduate Student Scholarship ($23,000)	**2016 - 2017**
Faculty of Physical Education and Recreation Travel Grant ($500)	**2017**
Faculty of Graduate Studies and Research Travel Award ($2,000)	**2016**
Jason Lang Scholarship ($1,000)	**2014**
University of Alberta Ringette Scholarship ($1,500)	**2012**
Millar Entrance Leadership Scholarship ($3,500)	**2010**
University of Alberta Academic Excellence Scholarship ($1,250)	**2010**
John Mazurek and Louis Mireau Award ($1,000)	**2010**
Alexander Rutherford Scholarship ($2,500)	**2010**
Ringette Canada Agnes Jacks Scholarship ($1,500)	**2010**
Premier's Citizenship Award	**2010**
Edmonton School District Superintendent's Award of Excellence	**2010**

COLLABORATIVE RESEARCH GRANTS

Dyadic gaze and movement behaviours during cooperative and competitive gameplay **2020 - 2022**
Investigators: D. A. Hayward, C. S. Chapman, J. K. Bertrand, and H. Ma
Agency: NSERC/SSHRC Research Fund, University of Alberta | Amount: $43,700

Using custom-built board games and video-game level editors to examine risky decision-making **2016 - 2017**
Investigators: C. S. Chapman, N. J. Wispinski, E. B. Lavoie, and J. K. Bertrand
Agency: Alberta Gambling Research Institute | Amount: $10,000

TEACHING EXPERIENCE

University Instructor - Experiential and In-Class Learning **July 2015 - Apr. 2021**
University of Alberta *Edmonton, Canada*

Designed and facilitated 90+ laboratory-based experiential seminars for classes of 30+ senior undergraduate students, covering neurophysiology, motor learning and skill acquisition, biomechanics, EMG, and experimental methods.

Managed equipment setup and in-class data collection, led hands-on demonstrations, and guided students through the practical application of physiological and biomechanical methods.

INDUSTRY RESEARCH EXPERIENCE

PhD Intern - Product Research and Design **Sept. 2021 - Oct. 2022**
Scicovery GmbH (Labvanced and PageGazer) *Remote (Germany)*

Led day-to-day PageGazer research and product development, translating webcam eye-tracking methods and user needs into study designs, requirements, user flows, Figma wireframes, metrics, dashboards, and technical documentation.

RESEARCH SUPERVISION AND MENTORSHIP

University of Lille **2025 - Present**

Supervise computer science interns in experimental software development, study implementation, and multimodal data analysis.

University of Alberta **2015 - 2023**

Mentored and trained 15+ undergraduate and graduate researchers in experimental methods, participant testing, data quality, analysis, and research project delivery.

ADDITIONAL RESEARCH AND PROFESSIONAL TRAINING

NSERC-CREATE SMART Network Entrepreneurship Program | University of Alberta **2021**
Neuroscience Graduate Program Laboratory Rotation | Visual Attention and Social Processes Lab, University of Alberta **2020**
NSERC-CREATE Complex Dynamics Summer School | McGill University **2018**
Computational Methods in Neuroscience Intensive Course | Campus Alberta Neuroscience **2016**

ACADEMIC SERVICE COMMUNICATION AND OUTREACH

Moderator | General Election Forum, University of Alberta Graduate Students' Association **2023**
Podcast Guest | 'Online Research - The Big Topics,' Labvanced Late to Lab Podcast **2022**
Workshop Presenter | NSERC-CREATE Knowledge and Skills Advanced Methods Workshop **2022**
Scientific Committee Member | Hidden Methods Virtual Conference **2022**

LEADERSHIP AND VOLUNTEERING

Chair and Former Vice-Chair | University of Alberta Graduate Students' Association Elections Committee **2015 - 2023**
President and Former Executive Vice President | Brainwaves Injury Prevention Educational Program **2017 - 2021**
Festival Co-Organizer | Locale, Edmonton's First Zero-Waste Festival **2018 - 2019**
Early Career Student Mentor | Women in STEM Mentoring Program **2016 - 2018**

TECHNICAL SKILLS

Programming and analysis: Python; R; MATLAB; SQL; statistical modelling; time-series and signal analysis; reproducible analysis pipelines; data visualization
Research systems: Laboratory and webcam eye tracking; optical and markerless motion capture; EEG; EMG; wearables; touchscreen and haptic systems; VR/AR/MR
Development and design: Unity; Git/GitHub; Figma; Labvanced; VS Code; Overleaf; AI-assisted research, prototyping, and coding workflows