

Spencer A. Arbuckle

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Education

2016–21	Ph.D. Neuroscience	Western University	advisors: Jörn Diedrichsen & Andrew Pruszynski
2010–14	B.Sc. (Hon.) Psychology	Queen's University	advisor: Ingrid Johnsrude

Publications

- [8] **Arbuckle SA.** (2021) Brain representations of dexterous hand control: Investigating the functional organization of individuated finger movements and somatosensory integration. (*PhD thesis*)
- [7] **Arbuckle SA**, Pruszynski JA, Diedrichsen J. (2021) Mapping the integration of sensory information across fingers in human sensorimotor cortex. *bioRxiv (preprint, in review)*
- [6] Fox AS, Holley D, Klink PC, **Arbuckle SA**, Barnes CA, Diedrichsen J, Kwok SC, Kyle C, Pruszynski JA, Seidlitz J, Zhou X, Poldrack RA, Gorgolewski KJ. (2021) Sharing voxelwise neuroimaging results from rhesus monkeys and other species with Neurovault. *NeuroImage* 225: 117518.
- [5] **Arbuckle SA**, Weiler J, Kirk EA, Rice CL, Schieber MH, Pruszynski JA, Ejaz N, Diedrichsen J. (2020) Structure of population activity in primary motor cortex for single finger flexion and extension. *Journal of Neuroscience* 40: 9210-9223.
- [4] **Arbuckle SA**, Yokoi A, Pruszynski JA, Diedrichsen J. (2019) Stability of representational geometry across a wide range of fMRI activity levels. *NeuroImage* 186: 155-163.
- [3] Yokoi A, **Arbuckle SA**, Diedrichsen J. (2018) The role of human primary motor cortex in the production of skilled finger sequences. *Journal of Neuroscience* 38: 1430-1442.
- [2] Diedrichsen J, Yokoi A, **Arbuckle SA**. (2018) Pattern Component Modeling: A flexible approach for understanding the representational structure of brain activity patterns. *NeuroImage* 180: 119-133.
- [1] Lambert C, **Arbuckle SA**, Holden R. (2016) The Marlow-Crowne Social Desirability Scale outperforms the BIDR Impression Management Scale for identifying fakers. *Journal of Research in Personality* 61: 80-86.

Awards & Scholarships

2020	Western University Neuroscience Research Day top poster award (\$100)
2019	DPZ Primate Systems Neuroscience Summer School Travel Award (€500)
2018	NSERC PGS-D Postgraduate Scholarship (\$63,000)
2018	Ontario Graduate Scholarship (\$15,000) – <i>declined</i>
2017	Western University Neuroscience Conference Travel Award (\$500)
2017	Computational Sensorimotor Neuroscience (<i>CoSMo</i>) Summer School – Best overall group project
2017	Brain Canada Travel Scholarship to attend <i>CoSMo</i> Summer School (\$1,500)
2017	BMI Collaborative Research Grant: Ejaz, Weiler, & Arbuckle (\$2,296)
2013–14	Queen's University Dean's Honour List
2010	Queen's University Academic Excellence Entrance Scholarship (\$1500)
2010	University of Winnipeg Special Entrance Scholarship (\$1750) – <i>declined</i>

Invited Talks

- 11/2020 Cortical contributions to human hand control. Be.Neuro Lab, Dept. of Bioengineering, Imperial College London, London, UK.
- 03/2018 Can fMRI be used to make inferences on neural representations? Dept. of Cognitive, Linguistic, & Psychological Sciences, Brown University, Providence, USA.
- 04/2017 An introduction to pattern component modeling. BLAM Lab, Dept. of Neurology, Johns Hopkins University School of Medicine, Baltimore, USA.

Workshop Participation

- 2019 Representational Similarity Analysis 3.0 Workshop. Collingwood, Canada.
- 2019 DPZ Primate Systems Neuroscience Summer School. Bad Bevensen, Germany. *travel grant awarded*
- 2017 Computational Sensorimotor Neuroscience (*CoSMo*). University of Minnesota, USA. *travel grant awarded*

Media & Outreach

- 2022 Volunteer with the Canadian Science Policy Centre
- 10/2021 Invited by UWO graduate student society to give an instructional lecture (“My advice for 10-minute science presentations”) for neuroscience graduate students [\[link\]](#)
- 12/2019 Research featured in The Dorsal Column (London Ontario-based science publication) [\[link\]](#)
- 07/2019 Co-organized and lead a two-day workshop with Dr. Marieke Mur (“Analysis of Neural Population Dynamics”) for the BMI Computational Core Methods Lunches at UWO (50+ attendees) [\[link\]](#)
- 08/2018 Interviewed about my research for CHRW 94.9FM Gradcast radio show [\[link\]](#)
- 2017–18, 20 Volunteer judge for the Thames Valley Science & Engineering Fair

Conference Talks

- [5] **Arbuckle SA***, Pruszynski JA, Diedrichsen J. (2020) Integration of tactile information from multiple fingers in human primary sensory cortex measured using high-resolution fMRI. Robarts Research Retreat, London, Canada.
- [4] **Arbuckle SA**, Weiler J, Kirk EA, Saikaley M, Rice C, Schieber M, Diedrichsen J, Ejaz N*. (2018) Representation of fingers and finger movement direction in the primary motor cortex. Society for the Neural Control of Movement, Santa Fe, USA.
- [3] Liu M*, **Arbuckle SA**, Okorokova L, Herrera* A, Kaiser A. (2017) Does S1 spiking activity encode sensory feedback for goal-directed movements in a grasping task? Advances in Motor Learning & Motor Control, Washington D.C., USA.
- [2] **Arbuckle SA***, Weiler J, Kirk EA, Saikaley M, Rice C, Schieber M, Diedrichsen J, Ejaz N. (2017) Extension and flexion representations in M1 spatially cluster around the moving finger. Advances in Motor Learning & Motor Control, Washington D.C., USA.
- [1] Ritz H, **Arbuckle SA**, Wild C, Johnsrude I.* (2015) Enhanced recognition memory for acoustically degraded sentences. 39th MidWinter Meeting of the Association for Research in Otolaryngology, Baltimore, USA.
- *indicates primary speaker*

Conference Posters

- [7] **Arbuckle SA***, Pruszynski JA, Diedrichsen J. (2020) Integration of tactile information from multiple fingers in human primary sensory cortex measured using high-resolution fMRI. Neuroscience Research Day, London, Canada. *top poster award*

- [6] **Arbuckle SA***, Pruszynski JA, Diedrichsen J. (2019) Integration of tactile information from multiple fingers in human primary sensory cortex measured using high-resolution fMRI. Society for Neuroscience, Chicago, USA.
- [5] **Arbuckle SA***, Weiler J, Kirk EA, Saikaley M., Rice C, Schieber M, Diedrichsen J, Ejaz N. (2018) Representation of fingers and finger movement direction in the primary motor cortex. Canadian Student Health Research Forum, Winnipeg, Canada. *nominated to attend by the Western Neuroscience graduate program*
- [4] **Arbuckle SA***, Weiler J, Kirk EA, Saikaley M., Rice C, Schieber M, Diedrichsen J, Ejaz N. (2018) Representation of fingers and finger movement direction in the primary motor cortex. Mechanisms of Dexterous Behaviour, HHMI Janelia, USA.
- [3] **Arbuckle SA***, Yokoi A, Diedrichsen J. (2017) Is representational similarity analysis stable across a broad range of overall fMRI activity levels? Organization for Human Brain Mapping, Vancouver, Canada. *travel grant awarded*
- [2] **Arbuckle SA***, Yokoi A, Diedrichsen J. (2016) Stability of representational similarity analysis across a large range of overall activation levels. Society for Neuroscience, San Diego, USA.
- [1] Diedrichsen J*, **Arbuckle SA**, Yokoi, A. (2016) Studying the representational structure of simple and complex hand movements in the human motor cortex. Neural Control of Movement, Montego Bay, Jamaica.

Teaching & Mentoring Experience

I have 8+ years of teaching assistant experience. Below I present a selection of my experience.

2020	Intro to Data Science I (compsci 4414)- TA	Western University
2020	Intro to Neural Networks (psyc 9221B / app math 9624B)- lectures	Western University
2018–21	Regular contributor at the Computational Core Methods Lunches	Western University
2017	Information Systems (compsci 1032)- TA	Western University
2016	Statistics for Science (stats 2244)- TA	Western University
2016	Intro to Statistics (stats 1024)- TA	Western University
2012–14	Principles of Psychology (psyc 100)- TA	Queen's University

Miscellaneous

Programming: MATLAB (advanced), Python (intermediate), html (intermediate), C++ (intermediate)

Invited Reviewer: Journal of Neurophysiology, NeuroImage, Swiss National Science Foundation (SNSF)