

Greydon Gilmore

Curriculum Vitae

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Expertise

- Single-neuron recordings,MEPs,SSEPs,AEPs
- Python, R, Bash, MATLAB
- Signal processing/Medical image analysis
- Software/Pipeline development

Scientific Production

- Number of publications: 39
- First authors contribution: 6
- h-index: 12

Education

- 2022–2024 **Postdoc Department of Mathematics**, Western University, London, Canada
Supervisor: Dr. Lyle Muller
- 2017–2022 **Ph.D. Biomedical Engineering**, Western University, London, Canada
Supervisor: Dr. Mandar Jog
Thesis: Towards A Comprehensive Software Suite for Stereotactic Neurosurgery
- 2013–2015 **M.Sc. Neuroscience**, Western University, London, Canada
Supervisor: Dr. Mandar Jog
Thesis: Deep brain stimulation and its effects on Parkinson disease spatiotemporal gait parameters
- 2010–2013 **B.Sc. Neuroscience**, Honours, Carleton University, Ottawa, Canada
Supervisor: Dr. Shawn Hayley
Thesis: Influence of paraquat and recent prior social defeat on affiliative behaviour Hippocampal neurogenesis in IL-6-deficient mice

Research Interests

- **neuromodulation**
deep brain stimulation for movement disorders and epilepsy
- **electrophysiology**
collection and analysis of electrophysiology data in functional neurosurgery
- **clinical software development**
develop open-source software for clinical applications and research

Honors & Awards

- 2022–2025 **Mitacs - Elevate Postdoctoral Fellowship**
Western University (Postdoctoral Fellow)
- 2020–2022 **Parkinson's Society of Canada**
Graduate Student Award – Western University (Ph.D. candidate)
○ \$20,000 CAD for two years
- 2019 **Graduate Student Teaching Award**
Teaching assistant for Physiology 2130 – Human physiology

- \$500 CAD
- 2017–2019 **Parkinson’s Society of Canada (declined)**
Graduate Student Award – Western University (Ph.D. candidate)
 - \$20,000 CAD for two years
- 2017–2019 **OCE Talent Edge Internship Program (26784)**
Intern Talentedge Program – Western University (Ph.D. candidate)
 - \$60,000 CAD for two years
- 2017 **Graduate Student Innovation Scholars**
WORLDDiscoveries – Western University (Ph.D. candidate)
 - \$1,500 CAD
- 2017 **Scholarship for Intraoperative Neurophysiological Monitoring Course**
Western University (Ph.D. candidate)
 - \$7,250 USD
- 2016 **Natural Sciences and Engineering Research Council of Canada**
Partnered grant with Fanshawe College – Western University
 - \$30,000 CAD for summer term
- 2014–2016 **Canadian Institute of Health Research**
Canadian Graduate Scholarship – Western University (M.Sc. Candidate)
 - \$18,500 CAD for two years
- 2013 **The University Medal in Science**
Highest academic standing in the faculty of science – Carleton University
 - \$7,250 USD
- 2010–2013 **Dean’s List**
Carleton University (B.Sc. Neuroscience)

Research Experiences

- 2013–2022 **Graduate Research Assistant**, Movement Disorders Center, London, Canada, under supervision of **Dr. Mandar Jog**
 - routinely collect spike traces from microelectrodes within the subthalamic nucleus and local field potentials from the motor cortex (ECoG), while the patient performs cognitive tasks in the operating room
 - analyze spike and LFP data within Python and MATLAB
 - localize all DBS electrodes using STEALTH
 - follow patients before surgery and up to 1-year post DBS surgery, while investigating various DBS parameter settings on motor outcome (eg. voltage, frequency, pulse width)
 - collect kinematic data using 17 inertial sensors and gait analysis software
 - statistical analysis on kinematic data for the purpose of understanding motor response to setting changes
 - manage patients according to proper GCP, FDA and ICH guidelines
 - effectively communicated innovative and novel research at many international conferences for several science and medical societies

- prepared several successful grant applications (Mitacs, CIHR, NSERC and Parkinson's society of Southwestern Ontario)
- ongoing manuscript preparation and publication

Professional Experience

- 2024-Present **Intraoperative Neurophysiologist**, Emory University Hospital, Department of Neurosurgery, Atlanta, Georgia
- common DBS targets: STN, GPi, VIM, CM, Pulvinar, ANT, cZi
- 2024-Present **Assistant Professor**, Emory University, Department of Neurosurgery, Atlanta, Georgia
- neurophysiology fellowship program leader
 - responsible for recruitment, training, and deployment of neurophysiology fellows
- 2022–2024 **Data Engineer**, London Health Sciences Centre, Department of Neurosurgery, London, Canada
- provide research support for the clinical team through clinical data curation and analysis
- 2016–2024 **Intraoperative Electrophysiologist**, London Health Sciences Centre, Department of Neurosurgery, London, Canada
- provide intraoperative electrophysiology support during neurosurgical procedures
 - common DBS targets: STN, GPi, VIM, CM, Pulvinar, ANT, cZi
 - extracellular single-unit recordings, audio evoked potentials, EEG/iEEG, subdural grids, SSEPs, MEPs

Publications

- 2024 Feyi Ogunsanya, Alaa Taha, **Greydon Gilmore**, Jason Kai, Tristan Kuehn, Arun Thuraijah, Mauricio C Tenorio, Ali R Khan, Jonathan C Lau (2024). MRI-degad: toward accurate conversion of gadolinium-enhanced T1w MRIs to non-contrast-enhanced scans using CNNs. In *Journal of Computer Assisted Radiology and Surgery*.
- 2024 Hellen Kreinter, Poul H Espino, Sonia Mejía, Khalid Alorabi, **Greydon Gilmore**, Jorge G Burneo, David A Steven, Keith W MacDougall, Michelle-Lee Jones, Giovanni Pellegrino, David Diosy, Seyed M Mirsattari, Jonathan Lau, Ana Suller Marti (2024). Disrupting the epileptogenic network with stereoelectroencephalography-guided radiofrequency thermocoagulation. In *Epilepsia*.
- 2024 Igor Varga, Eduard Bakstein, **Greydon Gilmore**, Jaromir May, Daniel Novak (2024). Statistical segmentation model for accurate electrode positioning in Parkinson's deep brain stimulation based on clinical low-resolution image data and electrophysiology. In *Plos one*.
- 2024 Roy AM Haast, Jason Kai, Alaa Taha, Violet Liu, **Greydon Gilmore**, Maxime Guye, Ali R Khan, Jonathan C Lau (2024). Mapping the topographic organization of the human zona incerta using diffusion MRI. In *bioRxiv*.

- 2024 Mohamad Abbass, **Greydon Gilmore**, Brendan Santyr, Alan Chalil, Alaa Taha, Mandar Jog, Keith MacDougall, Andrew G Parrent, Terry M Peters, Jonathan C Lau (2024). The impact of localization and registration accuracy on estimates of deep brain stimulation electrode position in stereotactic space. In *medRxiv*.
- 2023 Juan Bottan, Ashwaq Alshahrani, **Greydon Gilmore**, David Steven, Keith MacDougall, David Diosy, Seyed Mirsattari, Ana Suller-Marti(2023). Lack of spontaneous typical seizures during intracranial monitoring with stereo-electroencephalography. In *Epileptic Disorders*.
- 2023 Xiao Yiming, **Greydon Gilmore**, Jason Kai, Jonathan C. Lau, Terry Peters, Ali Khan (2023). A population-averaged structural connectomic brain atlas dataset from 422 HCP-aging subjects. In *Data in Brief*.
- 2023 Alaa Taha, **Greydon Gilmore**, Mohamad Abbass, Jason Kai, Tristan Kuehn, John Demarco, Geetika Gupta, Chris Zajner, Daniel Cao, Ryan Chevalier, Abrar Ahmed, Ali Hadi, Bradley G. Karat, Olivia W. Stanley AND Patrick J. Park, Kayla M. Ferko, Dimuthu Hemachandra, Reid Vassallo, Magdalena Jach, Arun Thuraiarah, Sandy Wong, Mauricio C. Tenorio, Feyi Ogunsanya, Ali Khan, Jonathan C. Lau (2023). Magnetic resonance imaging datasets with anatomical fiducials for quality control and registration. In *Scientific Data*.
- 2022 Nasim Mortazavi, Milad Khaki, **Greydon Gilmore**, Jorge Burneo, David Steven, Ana Suller-Marti, Julio Martinez-Trujillo (2022). Virtual visual navigation during context-dependent learning in the human hippocampus using intracranial recordings (SEEG). In *Journal of Vision*.
- 2022 Alaa Taha, **Greydon Gilmore**, Ali Khan, Jonathan C Lau (2022). An Indirect Deep Brain Stimulation Targeting Tool Using Salient Anatomical Fiducials. In *Neuromodulation*.
- 2022 Maryam H Mofrad, **Greydon Gilmore**, Dominik Koller, Seyed M Mirsattari, Jorge G Burneo, David A Steven, Ali R Khan, Ana Suller Marti, Lyle Muller (2022). Waveform detection by deep learning reveals multi-area spindles that are selectively modulated by memory load. In *Elife*.
- 2022 Dinkar Kulshreshtha, Marcus Pieterman, **Greydon Gilmore**, Mandar Jog (2022). Optimizing the selection of Parkinson's disease patients for neuromodulation using the levodopa challenge test. In *Journal of Neurology*.
- 2022 Mohamad Abbass, **Greydon Gilmore**, Alaa Taha, Ryan Chevalier, Magdalena Jach, Terry M Peters, Ali R Khan, Jonathan C Lau (2022). Application of the anatomical fiducials framework to a clinical dataset of patients with Parkinson's disease. In *Brain Structure and Function*.
- 2021 Thibault Martin, **Greydon Gilmore**, Claire Haegelen, Pierre Jannin, John SH Baxter (2021). Adapting the listening time for micro-electrode recordings in deep brain stimulation interventions. In *International Journal of Computer Assisted Radiology and Surgery*.
- 2021 Thibault Martin, Maxime Peralta, **Greydon Gilmore**, Paul Sauleau, Claire Haegelen, Pierre Jannin, John SH Baxter (2021). Extending convolutional neural networks for localizing the subthalamic nucleus from micro-electrode recordings in Parkinson's disease. In *Biomedical Signal Processing and Control*.

- 2021 Maryam H Mofrad, **Greydon Gilmore**, Seyed M Mirsattari, Jorge G Burneo, David A Steven, Ali Khan, Ana Suller Marti, Lyle Muller (2021). Waveform detection by deep learning reveals multi-area spindles that are selectively modulated by memory load. In *bioRxiv*.
- 2020 Jonathan C Lau, Yiming Xiao, Roy AM Haast, **Greydon Gilmore**, Kâmil Uludağ, Keith W MacDougall, Ravi S Menon, Andrew G Parrent, Terry M Peters, Ali R Khan (2020). Direct visualization and characterization of the human zona incerta and surrounding structures. In *Human brain mapping*.
- 2020 Igor Varga, Eduard Bakstein, **Greydon Gilmore**, Daniel Novak (2020). Image-Based Subthalamic Nucleus Segmentation for Deep Brain Surgery with Electrophysiology Aided Refinement. In *Workshop on Clinical Image-Based Procedures*.
- 2020 Daphne Hui, Aditya Murgai, **Greydon Gilmore**, Shabna Mohideen, Andrew Parrent, Mandar Jog (2020). Assessing the effect of current steering on the total electrical energy delivered and ambulation in Parkinson's disease. In *Nature: Scientific reports*.
- 2020 Mahsa Khosravi, S. Farokh Atashzar, **Greydon Gilmore**, Mandar Jog, Rajni Patel (2020). Intraoperative Localization of STN During DBS Surgery Using a Data-Driven Model. In *IEEE Journal of Translational Engineering in Health and Medicine*.
- 2019 **Greydon Gilmore**, Aditya Murgai, Abdulrahman Nazer, Andrew Parrent, Mandar Jog (2019). Zona incerta deep-brain stimulation in orthostatic tremor: efficacy and mechanism of improvement. In *Journal of Neurology*.
- 2019 **Greydon Gilmore**, Arnaud Gouelle, Mitchell Adamson, Marcus Pieterman, Mandar Jog (2019). Forward and backward walking in Parkinson disease: A factor analysis. In *Gait & Posture*.
- 2019 **Greydon Gilmore**, Aditya Murgai, Mandar Jog (2019). Letter to the Editor Regarding "Statistical Shape Analysis of Subthalamic Nucleus in Patients with Parkinson's Disease". In *World Neurosurgery*.
- 2019 Mahsa Khosravi, Seyed Farokh Atashzar, **Greydon Gilmore**, Mandar Jog, Rajni Patel (2019). Unsupervised Clustering of Micro-Electrophysiological Signals for localization of Subthalamic Nucleus during DBS Surgery. In *2019 9th International IEEE/EMBS Conference on Neural Engineering*.
- 2018 Mitch B. Adamson, **Greydon Gilmore**, Tyler W. Stratton, Navid Baktash, Mandar Jog (2018). Medication status and dual-tasking on turning strategies in Parkinson disease. In *Journal of the neurological sciences*.
- 2018 Mahsa Khosravi, Seyed Farokh Atashzar, **Greydon Gilmore**, Mandar Jog, Rajni Patel (2018). Electrophysiological signal processing for intraoperative localization of subthalamic nucleus during deep brain stimulation surgery. In *2018 IEEE Global Conference on Signal and Information Processing*.
- 2017 **Greydon Gilmore**, Donald Lee, Andrew Parrent, Mandar Jog (2017). The current state of post-operative imaging in the presence of deep brain stimulation electrodes. In *Movement Disorders*.
- 2017 **Greydon Gilmore**, Mandar Jog (2017). Future perspectives: Assessment tools and rehabilitation in the new age. In Fen, C.H., Barsottini, O. (1st edition, pp. 155-182), *Movement Disorders Rehabilitation*. New York, New York: Springer.

- 2017 Memar, S., Delrobaei, M., **Gilmore, G.**, McIsaac, K., Jog, M. (2017). Segmentation and detection of physical activities during a sitting task in Parkinson's disease participants using multiple inertial sensors. In *Journal of Applied Biomedicine*.
- 2017 Delrobaei, M., Baktash, N., **Gilmore, G.**, McIssaac K., Jog, M. (2017). Using wearable technology to generate objective Parkinson's disease dyskinesia severity score: Possibilities for home monitoring. In *IEEE Trans Neural Systems Rehabilitation Engineering*.
- 2016 Delrobaei, M., Tran, S., **Gilmore, G.**, McIssac, K., Jog, M. (2016). Characterization of multi-joint upper limb movements in a single task to assess bradykinesia. In *Journal of the Neurological Sciences*, 368 (337-342).
- 2015 Delrobaei, M., Tran, S., **Gilmore, G.**, Ogjanovic, K., McIssac, K., Jog, M. (2015). The impact of electrical parameters on bradykinesia of Parkinson's disease patients after deep brain stimulation surgery. In *Movement Disorders*, 30 (S88-S88).
- 2014 Delrobaei, M., Parrent, A., Tran, S., **Gilmore, G.**, Ogjanovic, K., McIssac, K., Jog, M. (2014). Quantifying the short-term effects of deep brain stimulation surgery on bradykinesia in Parkinson's disease patients. In *Biomedical Engineering 21th Iranian Conference*.

Teaching Experiences

- 2020–2021 **Teaching Assistant**, Human Physiology (PHYS 1020), Western University, London, Canada
- 2016–2020 **Teaching Assistant**, Human Physiology (PHYS 2130), Western University, London, Canada
- 2014–2015 **Teaching Assistant**, Student Development Centre (Indigenous Services), Western University, London, Canada
- 2013–2014 **Teaching Assistant**, Child Development (Psyc 2045), Western University, London, Canada

Conference Presentations

- 2022 **Society for Stereotactic and Functional Neurosurgery**, Atlanta, GA
Oral presentation of postdoc work
- 2017 **Society for Neuroscience**, Washington D.C.
Oral presentation of Ph.D. Thesis work
- 2016 **Society for Neuroscience**, San Diego, California
Oral presentation of Ph.D. Thesis work
- 2015 **Society for Neuroscience**, Chicago, Illinois
Oral presentation of Ph.D. Thesis work
- 2015 **International Neuromodulation Society**, Montreal, Quebec
Oral presentation of M.Sc. Thesis work
- 2014 **International Gait and Posture Conference**, Vancouver, British Columbia
Oral presentation of M.Sc. Thesis work
- 2014 **Canadian Association of Neuroscience Conference**, Montreal, Quebec
Oral presentation of M.Sc. Thesis work

Training and Certificates

- 2018 Deep Learning Reinforcement Learning Summer School
 - Vector Institute and CIFAR, Toronto, Canada
- 2017 Graduate Student Innovation Scholars
 - WORLDDiscoveries, Western University, London, Canada
- 2017 Intensive Intraoperative Neurophysiological Monitoring Course
 - Greenville Neuromodulation Centre, Greenville, Pennsylvania

Interests

- Magic performing magic for 20+ years
- Coffee travelled internationally to various cafes and maintained a blog with reviews

References

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