Greydon Gilmore

Curriculum Vitae

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Google Scholar
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Expertise

- **Electrophysiology:** single-neuron recordings,MEPs,SSEPs,AEPs
- **Technical Skills:** Python, R, Bash,MATLAB
- **Data & Imaging:** signal processing, medical image analysis

Professional Experience

2025-Present **Intraoperative Neurophysiologist**, London Health Sciences Centre, Dept. of Neurosurgery, London, Canada

- Perform extracellular single-unit, EEG/iEEG, and subdural grid recordings during neurosurgical procedures
- Conduct postoperative electrode localization and mapping

2024-2025 **Intraoperative Neurophysiologist**, Emory University Hospital, Dept. of Neurosurgery, Atlanta, USA

- Recorded intraoperative single-unit and macro-LFP signals during DBS and epilepsy cases; Targeted DBS structures: STN, GPi, VIM, CM, Pulvinar, ANT, cZi, ALIC, and PAG
- Supported preoperative electrode planning using Brainlab, StealthStation, ROSA, and Clearpoint; Assisted with stereotactic frame placement (Leksell)

2024-2025 **Assistant Professor of Neurosurgery**, Emory University, Dept. of Neurosurgery, Atlanta, USA

- Directed the Neurophysiology Fellowship Program
- Oversaw recruitment, training, and clinical deployment of neurophysiology fellows

2022-2024 **Data Engineer**, London Health Sciences Centre, Dept. of Neurosurgery, London, Canada

- Curated and standardized large-scale clinical datasets to support research initiatives
- Developed pipelines for data cleaning, analysis, and visualization for neurosurgical teams

2016-2024 **Intraoperative Neurophysiologist**, London Health Sciences Centre, Dept. of Neurosurgery, London, Canada

- Performed single-unit recordings, EEG/iEEG, LFP recordings during functional neurosurgical procedures; Targeted DBS structures: STN, GPi, VIM, CM, Pulvinar, ANT, cZi
- Supported preoperative electrode planning using Brainlab, StealthStation, and Renishaw platforms; Assisted with stereotactic frame placement (Leksell, CRW)

Education

2022–2024 **Postdoctoral Fellowship in Mathematics**, Western University, London, Canada
Supervisor: *Dr. Lyle Muller*

2017–2022 **Ph.D. in 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** — mechanisms and clinical applications
- **Deep Brain Stimulation** — for movement disorders and epilepsy
- **Electrophysiology** — intraoperative single-unit and LFP recordings
- **Data Science in Neurosurgery** — development of computational tools for collection, analysis, and visualization electrophysiology and medical imaging data
- **Clinical Software Development** — creation of open-source platforms for surgical planning and research translation

Research Experiences

2013–2022 **Graduate Research Assistant**, Movement Disorders Center, Western University, London, Canada
Supervisor: **Dr. Mandar Jog**

- Analyzed electrophysiological and kinematic datasets using Python and MATLAB to study motor responses to DBS parameter changes
- Localized DBS electrodes with in-house imaging and software tools to evaluate accuracy and outcomes
- Designed and executed statistical analyses of gait and motor data collected with inertial sensor systems
- Secured competitive funding (Mitacs, CIHR, NSERC, Parkinson Society of Southwestern Ontario) through successful grant writing
- Presented research findings at national and international conferences, including Society for Neuroscience and International Neuromodulation Society

Honors & Awards

2022–2025 **Mitacs Elevate Postdoctoral Fellowship**
Western University — $60,000 CAD

2020–2022 **Graduate Student Award**
Parkinson's Society of Canada, Western University — $20,000 CAD

2019 **Graduate Student Teaching Award**
Western University — TA for Human Physiology (PHYS 2130) — $500 CAD

2017–2019 **Graduate Student Award (declined)**
Parkinson's Society of Canada, Western University — $20,000 CAD

2017–2019 **TalentEdge Internship Program**
Ontario Centres of Excellence (OCE), Western University — $60,000 CAD

2017 **Graduate Student Innovation Scholars**
WORLDDiscoveries, Western University — $1,500 CAD

2017 **Scholarship for Intraoperative Neurophysiological Monitoring Course**
Greenville Neuromodulation Center, Greenville, Pennsylvania — $7,250 USD

2014–2016 **Canadian Graduate Scholarship (Master's)**
Canadian Institutes of Health Research (CIHR), Western University — $18,500 CAD

2013 **University Medal in Science**
Carleton University — Highest academic standing in the Faculty of Science — $7,250 USD

Publications

- **Total publications:** 39 (6 first-author)
- **h-index:** 13

2025 Mohamad Abbass, Alaa Taha, **Greydon Gilmore**, Brendan Santyr, Alan Chalil, Mandar Jog, Keith MacDougall, Andrew G Parrent, Terry M Peters, Jonathan C Lau (2025). The impact of localization and registration accuracy on estimates of deep brain stimulation electrode position in stereotactic space. In *Imaging Neuroscience*.

2025 Juan S Bottan, Fuad Almalki, Maryam Nabavi Nouri, Jonathan C Lau, Alla Iansavichene, **Greydon Gilmore**, Michael Miller, Sandrine de Ribaupierre, Andrea V Andrade (2025). Radiofrequency-thermocoagulation in pediatric epilepsy surgery: A systematic review and pooled analysis of cases. In *Seizure: European Journal of Epilepsy*.

2024 Feyi Ogunsanya, Alaa Taha, **Greydon Gilmore**, Jason Kai, Tristan Kuehn, Arun Thurairajah, 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 Thurairajah, 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 nuleus 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 Parkinosn's disease patients. In *Biomedical Engineering 21th Iranian Conference*.

Teaching Experiences

2024–2025 **Neurophysiology Fellowship**, Emory University, Dept. of Neurosurgery, Atlanta, USA
Mentored and supervised neurophysiology fellows during neurosurgical cases

2020–2021 **Teaching Assistant**, Human Physiology (PHYS 1020), Western University, London, Canada
Supported course delivery and grading for undergraduate physiology students

2016–2020 **Teaching Assistant**, Human Physiology (PHYS 2130), Western University, London, Canada
Facilitated tutorials, assisted in laboratory sessions, and evaluated student work

2014–2015 **Teaching Assistant**, Student Development Centre (Indigenous Services), Western University, London, Canada
Provided academic support and physiology tutoring for Indigenous students

2013–2014 **Teaching Assistant**, Child Development (PSYC 2045), Western University, London, Canada
Facilitated tutorials, guided student projects, and supported assessment in child development

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

Conference Presentations

2024 **Society for Stereotactic and Functional Neurosurgery**, Nashville, TN
Poster: *Automatic computation of skull based accuracy measures enables improved quality control and technical advancements in stereotactic neurosurgery*

2022 **Society for Stereotactic and Functional Neurosurgery**, Atlanta, GA
Poster: *Contact Localization within Subthalamic Nucleus in Deep Brain Stimulation for Parkinson Disease*

2017 **Society for Neuroscience**, Washington D.C.
Oral presentation: *Ph.D. work on stereotactic neurosurgery and electrophysiology*

2016 **Society for Neuroscience**, San Diego, California
Oral presentation: *Ph.D. work on stereotactic neurosurgery and electrophysiology*

2015 **Society for Neuroscience**, Chicago, Illinois
Oral presentation: *M.Sc. work on electrophysiology in neuromodulation*

2015 **International Neuromodulation Society**, Montreal, Quebec
Oral presentation: *M.Sc. work on electrophysiology in neuromodulation*

2014 **International Gait and Posture Conference**, Vancouver, BC
Poster: *M.Sc. work on gait dynamics in Parkinson's disease*

Interests

Magic — Performing and teaching for 20+ years

Coffee — International travel to study coffee culture; former café review blog

References

Dr. Zeke Gleichgerrcht
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Dr. Ana SullerMarti
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