Greydon Gilmore

Curriculum Vitae

greydon.gilmore@gmail.com
www.greydongilmore.com
Google Scholar
ORCID: 0000-0001-7523-5734

Professional Profile

Neurophysiologist and biomedical engineer with more than a decade of clinical and research experience in intraoperative neurophysiology and functional neurosurgery across major academic centres in Canada and the United States. Clinical IONM expertise spans cranial, spine, deep brain stimulation, and stereo-electroencephalography neurosurgical procedures. Former Assistant Professor of Neurosurgery at Emory University and Director of its Neurophysiology Fellowship Program. Ph.D. trained researcher with extensive publications and experience developing clinical software for neurosurgical planning, electrophysiology, and medical imaging.

Clinical & Technical Expertise

- **Clinical Neurophysiology:** Single-unit micro-electrode recordings, LFPs (DBS/SEEG), MEPs, SSEPs, EEG, EMG, tEMG, phase reversal, dorsal column mapping, and cranial nerve monitoring
- **Functional Neurosurgery procedures:** deep brain stimulation, epilepsy surgery, electrode localization, presurgical trajectory planning, and stereotactic frame placement
- **Cranial & Spine procedures:** TLIF, ACDF, PCDF, OC fusion, scoliosis correction, laminectomy, posterior fossa tumour, MVD, and acoustic neuroma
- **Clinical Systems & Platforms:** Medtronic NIM, Cadwell IOMAX, Natus NeuroWorks, Alpha Omega, FHC, Brainlab, StealthStation, Renishaw, ROSA, and ClearPoint
- **Computational & Data Science:** Python, MATLAB, R, Bash, Git, electrophysiological signal processing, medical image analysis, data organization, statistical analysis, and research software development

Professional Experience

2025-Present **Intraoperative Neurophysiologist**, St. Michael's Hospital, Dept. of Neurosurgery, Toronto, Canada

- Provide neurophysiological monitoring for spine and cranial neurosurgical procedures: MEPs, SSEPs, tEMG, EEG, DC mapping, and cranial nerve monitoring
- Monitor complex spine procedures: TLIF, ACDF, PCDF, OC fusion, scoliosis correction and laminectomy
- Monitor cranial procedures: posterior fossa tumours, microvascular decompression, and acoustic neuromas

2024-Present **Intraoperative Neurophysiologist (Contractor)**, Horizon Health, Dept. of Neurosurgery, Moncton, Canada

- Provide external neurophysiology support for functional neurosurgical cases
- Conduct presurgical electrode planning, intraoperative neurophysiological testing and postoperative electrode mapping

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
- Led and participated in research studies involving intraoperative neurophysiology and functional neurosurgery
- Contributed to grant development and research ethics submissions

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

- Performed single-unit microelectrode and macro-LFP recordings during deep brain stimulation and epilepsy procedures
- Worked with DBS targets including STN, GPi, VIM, CM, pulvinar, ANT, cZi, ALIC, and PAG
- Supported presurgical electrode planning using Brainlab, StealthStation, ROSA, and Clearpoint
- Assisted with stereotactic frame placement using the Leksell Vantage system

2015-2024 **Intraoperative Neurophysiologist**, London Health Sciences Centre, Dept. of Neurosurgery, London, Canada

- Provided neurophysiological support for functional neurosurgical procedures: single-unit recordings, EEG/iEEG, and LFP recordings
- Supported DBS procedures targeting STN, GPi, VIM, CM, pulvinar, ANT, and cZi
- Supported presurgical electrode planning using Brainlab, StealthStation, and Renishaw platforms
- Curated and standardized large-scale clinical datasets to support neurosurgical research
- Developed computational pipelines for clinical data cleaning, analysis, and visualization
- Assisted with stereotactic frame placement using the Leksell Model G system

Education

2022–2024 **Postdoctoral Fellowship in 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

Research & Innovation

2022-present **Developer**, neurophys software solutions Ltd (BN: 731930566RC0001)

- Develop open-source software supporting clinical and research applications in neurosurgery
- Developed **trajectoryGuide**, an open-source software for planning stereotactic electrode trajectories
- Developed **data2bids**, a platform for anonymizing and organizing EEG/iEEG recordings and medical imaging data
  - Licensed software to the University of Toronto and Western University for use within the EpLink epilepsy research study

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 investigate motor responses to DBS parameter changes
- Localized DBS electrodes using in-house imaging and software tools to evaluate targeting accuracy and clinical outcomes
- Designed and executed statistical analyses of gait and motor data collected using inertial sensor systems
- Secured competitive research funding through successful grant applications to Mitacs, CIHR, NSERC, and the Parkinson Society of Southwestern Ontario
- Presented research findings at national and international scientific conferences

Academic Leadership & Teaching

2024–2025 **Neurophysiology Fellowship**, Emory University, Dept. of Neurosurgery, Atlanta, USA

- Directed the Neurophysiology Fellowship Program
- Mentored and supervised neurophysiology fellows including clinical training and deployment of fellows

2013–2021 **Teaching Assistant**, Western University, London, Canada

- Human Physiology, PHYS 1020, 2020-2021. Supported course delivery and grading
- Human Physiology, PHYS 2130, 2016-2020. Facilitated tutorials, laboratory sessions, and student assessment
- Student Development Centre, Indigenous Services, 2014-2015. Provided academic support and physiology tutoring
- Child Development, PSYC 2045, 2013-2014. Facilitated tutorials and supported assessment

Honors & Awards

2022–2024 **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 Faculty of Science

Selected Publications

45 publications (7 first-author) | h-index: 16

Full publication list available at Google Scholar

2026 Daniela Herrera-Chaves, **Greydon Gilmore**, Mohamad Abbass, Lyle Muller, Ana SullerMarti, Seyed Mirsattari, Stefan Kohler, Laura Batterink (2026). The Role of Modality-specific Brain Regions in Statistical Learning: Insights from Intracranial Neural Entrainment. In *Journal of Cognitive Neuroscience*.

2026 Arun Thurairajah, **Greydon Gilmore**, Amit Persad, Amir Youshani, Alaa Taha, Mohamad Abbass, Brendan Santyr, Khalid AlOrabi, Jorge Burneo, Giovanni Pellegrino, Ana SullerMarti, Andrew Parrent, Keith MacDougallDavid Steven, Jonathan C Lau (2026). Stereoelectroencephalography accuracy in a series of over 3000 trajectories. In *medRxiv*.

2026 Rebecca Roth, Victor Karpychev, Jessica Decker, Andrew Schell, Stephan Hamann, **Greydon Gilmore**, Nimit Desal, Daniel Schacter, Leonardo Bonilha, Ezequiel Gleichgerrcht (2026). Impaired autobiographical remembering and future thinking in temporal lobe epilepsy. In *Epilepsy & Behaviour*.

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*.

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 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 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 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 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 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*.

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*.

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*.

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*

Training & Certificates

2024-2025 **Neurophysiologist Training Program**, Shared Health, Winnipeg, Canada

- Instructor: Cedrik Ruiz
- Comprehensive 6 month course on IONM theory and clinical practice

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, USA

Interests

Magic - Performing and teaching for 20+ years

Coffee - International travel and specialty coffee culture