

RAVNOOR SINGH GILL

POST-DOCTORAL RESEARCHER

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EDUCATION

- PhD** Integrated Program in Neuroscience
2015–2022 McGill University, Montréal, Québec
advised by : Prof. Andrea Bernasconi
thesis : [Quantitative imaging of epileptogenic lesions in MRI-negative epilepsy](#)
gpa : 3.77/4.00
- MSc** Graduate Program in Neuroscience
2012–2015 University of Western Ontario, London, Ontario
first class honors
advised by : Profs. Stan Leung & Seyed Mirsattari
thesis : [Resting-state functional network disruptions in a rodent model of mesial temporal lobe epilepsy](#)
gpa : 3.93/4.00
- BEng** Biotechnology
2008–2012 Panjab University, Chandigarh, India
first class honors
gpa : 3.82/4.00

TECHNICAL SKILLS

- General Machine Learning & Scientific Computing (PyTorch, Keras, Scikit-Learn, Pandas, NumPy/SciPy), Docker, Git, Unix
- Programming Python, R, MATLAB, \LaTeX
- Design Web Design (HTML, CSS), Graphic Design & Typesetting (Adobe Illustrator/Photoshop, OmniGraffle)

RESEARCH EXPERIENCE

- Machine Learning Intern HelpWear Inc., Toronto, Ontario
W2021 algorithm development for denoising, feature extraction, and event detection in a wearable continuous heart monitoring solution
- Research Assistant Neuroimaging of Epilepsy Laboratory - McConnell Brain Imaging Center, Montréal, Québec
F2015–S2022 Profs. Neda & Andrea Bernasconi – multi-contrast MR imaging analysis using machine learning for clinical decision support in MRI-negative epilepsy
- Research Assistant University of Western Ontario, London, Ontario
F2012–S2015 Prof. Stan Leung – resting-state fMRI, EEG, experimental models of temporal lobe epilepsy (TLE)
- Research Project University Institute of Engineering & Technology, Panjab University, Chandigarh, India
F2011–S2012 Dr. Ranjana Bhatia – agrigenomics, 16S rDNA based PCR
- Research Intern Dept. of Bioinformatics & Biotechnology, Jaypee University, Solan (HP), India
S2011 Dr. Chittaranjan Rout – bioinformatics, computer-aided drug design
- Research Intern Central Research Institute, Kasauli (HP), India
S2010 Dr. S.R. Bhalla – vaccinology and immunotherapeutics, bioprocess technology

TEACHING

- Psych 1000 Introduction to Psychology
W2014/F2012 *teaching assistant* – University of Western Ontario
- Psych 2010a The Human Mind
F2013 *teaching assistant* – University of Western Ontario

AWARDS

PhD Scholarship F2017–S2020	Fonds de recherche du Québec – Santé (FRQS), Government of Québec
Merit Award F2020	Young Investigator Award, American Epilepsy Society Meeting, Virtual
Merit Award F2019	Grass Foundation Young Investigator Award, American Epilepsy Society Meeting, Baltimore, MD, USA
Travel Award F2019	MICCAI Travel Award, MICCAI Meeting, Shenzhen, China
Graduate Excellence Award W2019	IPN Star Award, Integrated Program in Neuroscience, McGill University
Travel Award W2019	Kenelm M. Winslow Travel Award, Montreal Neurological Institute
Travel Award F2018	Young Investigator Award, American Epilepsy Society Meeting, New Orleans, LA, USA
Travel Award F2018	Graduate Research Enhancement and Travel (GREAT) award, Integrated Program in Neuroscience
Travel Award F2018	Quebec Bio-imaging Network (QBIN) Travel Award, Montreal Neurological Institute
Travel Award F2018	MICCAI/NIH Travel Award, MICCAI Meeting, Granada, Spain
Merit Award S2018	Merit Abstract Award, Organization for Human Brain Mapping Meeting, Singapore
Travel Award W2018	Tom Gevas Student Travel Award, Montreal Neurological Institute
Travel Award F2017	Graduate Research Enhancement and Travel (GREAT) award, Integrated Program in Neuroscience
MSc Scholarship 2012–2014	Recipient of a 2-year Western Graduate Research Scholarship (WGRS)
MSc Scholarship 2012–2014 <i>declined</i>	Eligible for Ministry of Human Resource & Development's post-graduate scholarship on securing All-India Rank 131 (99.1 th percentile) in Graduate Aptitude Test in Engineering (Biotechnology)

PUBLICATIONS

peer-reviewed journal
articles

H. M. Lee, S.-J. Hong, **R. Gill**, B. Caldairou, I. Wang, J.-g. Zhang, F. Deleo, D. Schrader, F. Bartolomei, M. Guye, K. H. Cho, C. Barba, S. Sisodiya, G. Jackson, R. E. Hogan, L. Wong-Kisiel, G. D. Cascino, A. Schulze-Bonhage, I. Lopes-Cendes, F. Cendes, R. Guerrini, B. Bernhardt, N. Bernasconi, and A. Bernasconi, "Multimodal mapping of regional brain vulnerability to focal cortical dysplasia," *Brain*, 2023. doi: [10.1093/brain/awad060](https://doi.org/10.1093/brain/awad060).

H. M. Lee, F. Fadaie, **R. Gill**, B. Caldairou, V. Sziklas, J. Crane, S.-J. Hong, B. C. Bernhardt, A. Bernasconi, and N. Bernasconi, "Decomposing MRI phenotypic heterogeneity in epilepsy: A step towards personalized classification," *Brain*, 2022. doi: [10.1093/brain/awab425](https://doi.org/10.1093/brain/awab425).

B. Caldairou, N. A. Foit, C. Mutti, F. Fadaie, **R. Gill**, H. M. Lee, T. Demerath, H. Urbach, A. Schulze-Bonhage, A. Bernasconi, et al., "MRI-based machine learning prediction framework to lateralize hippocampal sclerosis in patients with temporal lobe epilepsy," *Neurology*, vol. 97, no. 16, e1583–e1593, 2021. doi: [10.1212/WNL.0000000000012699](https://doi.org/10.1212/WNL.0000000000012699).

F. Fadaie, H. M. Lee, B. Caldairou, **R. S. Gill**, V. Sziklas, J. Crane, B. C. Bernhardt, S.-J. Hong, A. Bernasconi, and N. Bernasconi, "Atypical functional connectome hierarchy impacts cognition in temporal lobe epilepsy," *Epilepsia*, 2021. doi: [10.1111/epi.17032](https://doi.org/10.1111/epi.17032).

R. S. Gill, H.-M. Lee, B. Caldairou, S.-J. Hong, C. Barba, F. Deleo, L. D'Incerti, V. C. M. Coelho, M. Lenge, M. Semmelroch, et al., "Multicenter validation of a deep learning detection algorithm for focal cortical dysplasia," *Neurology*, vol. 97, no. 16, e1571–e1582, 2021. doi: [10.1212/WNL.0000000000012698](https://doi.org/10.1212/WNL.0000000000012698).

H. M. Lee, **R. Gill**, F. Fadaie, K. H. Cho, M. C. Guiot, S.-J. Hong, N. Bernasconi, and A. Bernasconi, "Unsupervised machine learning reveals lesional variability in focal cortical dysplasia at mesoscopic scale," *NeuroImage: Clinical*, p. 102438, 2020. doi: [10.1016/j.nicl.2020.102438](https://doi.org/10.1016/j.nicl.2020.102438).

A. Bernasconi, F. Cendes, W. H. Theodore, **R. S. Gill**, M. J. Koepp, R. E. Hogan, G. D. Jackson, P. Federico, A. Labate, A. E. Vaudano, I. Blümcke, P. Ryvlin, and N. Bernasconi, "Recommendations for the use of structural magnetic resonance imaging in the care of patients with epilepsy: A consensus report from the international league against epilepsy neuroimaging task force," *Epilepsia*, vol. 60, no. 6, pp. 1054–1068, 2019. doi: [10.1111/epi.15612](https://doi.org/10.1111/epi.15612).

S.-J. Hong, H.-M. Lee, **R. Gill**, J. Crane, V. Sziklas, B. C. Bernhardt, N. Bernasconi, and A. Bernasconi, "A connectome-based mechanistic model of focal cortical dysplasia," *Brain*, vol. 142, no. 3, pp. 688–699, 2019. doi: [10.1093/brain/awz009](https://doi.org/10.1093/brain/awz009).

R. S. Gill, S. M. Mirsattari, and L. S. Leung, "Resting state functional network disruptions in a kainic acid model of temporal lobe epilepsy," *NeuroImage: Clinical*, vol. 13, pp. 70–81, 2017. doi: [10.1016/j.nicl.2016.11.002](https://doi.org/10.1016/j.nicl.2016.11.002).

S.-J. Hong, B. C. Bernhardt, **R. S. Gill**, N. Bernasconi, and A. Bernasconi, "The spectrum of structural and functional network alterations in malformations of cortical development," *Brain*, vol. 140, no. 8, pp. 2133–2143, 2017. doi: [10.1093/brain/awx145](https://doi.org/10.1093/brain/awx145).

peer-reviewed conference
papers

R. S. Gill, B. Caldairou, N. Bernasconi, and A. Bernasconi, "Uncertainty-informed detection of epileptogenic brain malformations using bayesian neural networks," in *International Conference on Medical Image Computing and Computer-Assisted Intervention*, Springer, Cham, 2019, pp. 225–233. doi: [10.1007/978-3-030-32251-9_25](https://doi.org/10.1007/978-3-030-32251-9_25).

R. S. Gill, S.-J. Hong, F. Fadaie, B. Caldairou, B. C. Bernhardt, C. Barba, A. Brandt, V. C. Coelho, L. d'Incerti, M. Lenge, et al., "Deep convolutional networks for automated detection of epileptogenic brain malformations," in *International Conference on Medical Image Computing and Computer-Assisted Intervention*, Springer, Cham, 2018, pp. 490–497. doi: [10.1007/978-3-030-00931-1_56](https://doi.org/10.1007/978-3-030-00931-1_56).

R. S. Gill, S.-J. Hong, F. Fadaie, B. Caldairou, B. Bernhardt, N. Bernasconi, and A. Bernasconi, "Automated detection of epileptogenic cortical malformations using multimodal MRI," in *Deep Learning in Medical Image Analysis and Multimodal Learning for Clinical Decision Support, MICCAI*, Springer, Cham, 2017, pp. 349–356. doi: [10.1007/978-3-319-67558-9_40](https://doi.org/10.1007/978-3-319-67558-9_40).

S.-J. Hong, B. Bernhardt, **R. S. Gill**, N. Bernasconi, and A. Bernasconi, "Connectome-based pattern learning predicts histology and surgical outcome of epileptogenic malformations of cortical development," in *International Conference on Medical Image Computing and Computer-Assisted Intervention*, Springer, Cham, 2017, pp. 390–397. doi: [10.1007/978-3-319-66182-7_45](https://doi.org/10.1007/978-3-319-66182-7_45).

talks

R. S. Gill, *Combined automated hippocampal segmentation and focus lateralization in temporal lobe epilepsy*, Research presented at the American Epilepsy Society (AES) Annual Meeting, Nashville, TN, USA, Dec. 2022.

R. S. Gill, *Automated hippocampal subfields segmentation using deep learning*, Research presented at the American Epilepsy Society (AES) Annual Meeting, Virtual, Dec. 2020.

R. Gill, *Detection of MRI-negative focal cortical dysplasia using uncertainty-informed bayesian deep learning: A multicentre validation study*, Research presented at the American Epilepsy Society (AES) Annual Meeting, Baltimore, MD, USA, Dec. 2019.

R. S. Gill, *Uncertainty-informed detection of epileptogenic brain malformations using bayesian neural networks*, Research presented at the MICCAI Annual Meeting, Shenzhen, China, Oct. 2019.

R. S. Gill, *Deep convolutional neural networks for detection of cortical dysplasia: A multicenter validation*, Research presented at the American Epilepsy Society (AES) Annual Meeting, New Orleans, LA, USA, Dec. 2018.

R. S. Gill, *Deep convolutional neural networks for detection of cortical dysplasia: A multicenter validation*, Research presented at the Organization for Human Brain Mapping (OHBM) Annual Meeting, Singapore, Jun. 2018.

R. S. Gill, *Automated detection of epileptogenic cortical malformations using multimodal MRI*, Paper presented at the Multimodal Learning for Clinical Decision Support Workshop of MICCAI, Quebec City, QC, Sep. 2017.

R. S. Gill, *Functional network alterations in a kainic acid based rodent model of TLE using resting state fMRI*, Research presented at the Epilepsy Research Day, London Health Sciences Centre, London, ON, Feb. 2014.

conference posters

R. S. Gill, S.-J. Hong, F. Fadaie, B. Caldairou, B. Bernhardt, C. Barba, V. Coelho, M. Lenge, M. Semmelroch, F. Bartolomei, M. Guye, F. Cendes, R. Guerrini, G. Jackson, N. Bernasconi, and A. Bernasconi, "MRI-negative epilepsy: A systematic review & meta-analysis," in *The 76th Annual Meeting of the American Epilepsy Society*, Nashville, TN, USA, Dec. 2022.

R. S. Gill, B. Caldairou, N. Bernasconi, and A. Bernasconi, "Uncertainty-informed detection of epileptogenic brain malformations using bayesian neural networks," in *International Conference on Medical Image Computing and Computer-Assisted Intervention*, Shenzhen, China, Oct. 2019.

R. S. Gill, S.-J. Hong, F. Fadaie, B. Caldairou, B. Bernhardt, C. Barba, V. Coelho, M. Lenge, M. Semmelroch, F. Bartolomei, M. Guye, F. Cendes, R. Guerrini, G. Jackson, N. Bernasconi, and A. Bernasconi, "Deep convolutional neural networks for detection of cortical dysplasia: A multicenter validation," in *Organization for Human Brain Mapping (OHBM) Annual Meeting*, Singapore, Jun. 2018.

R. S. Gill, S.-J. Hong, F. Fadaie, B. Caldairou, B. Bernhardt, C. Barba, V. Coelho, M. Lenge, M. Semmelroch, F. Bartolomei, M. Guye, F. Cendes, R. Guerrini, G. Jackson, N. Bernasconi, and A. Bernasconi, "Deep convolutional neural networks for detection of cortical dysplasia: A multicenter validation," in *The 72nd Annual Meeting of the American Epilepsy Society*, New Orleans, LA, USA, Dec. 2018.

S.-J. Hong, H. Min-Lee, **R. S. Gill**, B. Bernhardt, N. Bernasconi, and A. Bernasconi, "Focal cortical dysplasia: Relation between lesion topography and sulcal pits," in *Organization for Human Brain Mapping (OHBM) Annual Meeting*, Singapore, Jun. 2018.

R. S. Gill, S.-J. Hong, F. Fadaie, B. Caldairou, B. Bernhardt, N. Bernasconi, and A. Bernasconi, "Automated detection of subtle focal cortical dysplasia using multi-contrast MRI," in *The 71st Annual Meeting of the American Epilepsy Society*, Washington, DC, USA, Dec. 2017.

S.-J. Hong, B. Bernhardt, **R. Gill**, N. Bernasconi, and A. Bernasconi, "Connectome-based pattern learning predicts histology and surgical outcome of epileptogenic malformations of cortical development," in *International Conference on Medical Image Computing and Computer-Assisted Intervention*, Quebec City, QC, Canada, Sep. 2017.

S.-J. Hong, B. Bernhardt, **R. S. Gill**, N. Bernasconi, and A. Bernasconi, "Focal cortical dysplasia: Abnormal functional connectome embedding predicts histopathology and surgical outcome," in *The 71st Annual Meeting of the American Epilepsy Society*, Washington, DC, USA, Dec. 2017.

R. S. Gill, S. M. Mirsattari, and L. S. Leung, "Resting state functional network disruptions in a kainic acid model of temporal lobe epilepsy," in *The 70th Annual Meeting of the American Epilepsy Society*, Houston, TX, USA, Dec. 2016.

S.-J. Hong, B. C. Bernhardt, **R. S. Gill**, N. Bernasconi, and A. Bernasconi, "Multimodal connectome organization across the spectrum of cortical malformations," in *The 70th Annual Meeting of the American Epilepsy Society*, Houston, TX, USA, Dec. 2016.

book chapters H. M. Lee, **R. S. Gill**, N. Bernasconi, and A. Bernasconi, "Machine learning in neuroimaging of epilepsy," *Machine Learning for Brain Disorders*, in press.

A. Bernasconi, S.-J. Hong, M. Liu, **R. Gill**, E. Hogan, and N. Bernasconi, "Computational neuroimaging of epilepsy," *Imaging Biomarkers in Epilepsy*, p. 55, 2018. DOI: [10.1017/9781316257951](https://doi.org/10.1017/9781316257951).

LANGUAGES

English full professional proficiency

Punjabi/Hindi native or bilingual proficiency