

gregorykiar

biomedical engineer



contact

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gkiar.me 

gkiar 
     

languages

english native speaker,
basic ASL

programming

Python, R, Bash 
MATLAB, C++, AWS,
Ruby, LaTeX, etc.

soft skills

leadership, teaching,
sci. comm., design,
problem solving

education

- 2017 – now **Ph.D. candidate** in Biomedical Engineering McGill University, Montreal, QC
Thesis work supervised by Alan Evans and Tristan Glatard on a project entitled: Characterizing the Stability of Neuroimaging Analyses Through Perturbations in Experimental Design. All code and data have been made publicly available.
- 2014 – 2016 **M.S.E** in Biomedical Engineering Johns Hopkins University, Baltimore, MD
Thesis work was supervised by Joshua T. Vogelstein on a project entitled: GREMLIN: Graph Estimation from MR images Leading to Inference in Neuroscience. All code and data have been made publicly available.
- 2010 – 2014 **B.Eng** in Biomedical and Electrical Engineering Carleton University, Ottawa, ON
Capstone work was supervised by Leonard MacEachern on a project entitled: Electrical muscle stimulation with concurrent EMG feedback of the upper arm for applications in stroke rehabilitation.
- 2018 **Software and Data Carpentry Instructor Training** Compute Canada, Toronto, ON
Running workshops in the context of an evidence-based instructional pedagogy.
- 2016 **Exploring the Human Connectome** The Human Connectome Project, Boston, MA
Development and deployment of connectome estimation pipelines.
- 2015 **Presenting Data and Information** Edward Tufte, Baltimore, MD
Cultivate skills in effective communication with scientific figures.

experience

Academic Experience

Current Positions & Activities

- 05/17 – now **McGill Centre for Integrative Neuroscience (MCIN)** Montreal, QC
Software Developer & Researcher
Responsible for the exploration and integration of distributed software services with high performance computing clouds and clusters, providing development, training, and support towards the use of tools and services within international collaborations, and developing methods for evaluating and describing analysis software in neuroimaging.
- 01/19 – now **Concordia Continuing Education** Montreal, QC
Instructor & Curriculum Developer
Responsible for the training of working professionals in the basics of "Big Data Technology," including fundamental tools for software development such as Bash, Git, and Docker, as well as software for numerical analysis such as Python and R. Core contributor in the development of new courses within the "Big Data Solutions for Business" diploma program.

06/18 – now **Organization for Human Brain Mapping (OHBM)** Minneapolis, MN
Treasurer - Open Science Special Interest Group
Responsible for the procurement and management of finances for the special interest group. Includes creating budgets, interfacing with sponsors and vendors, as well as event organizers for the various activities run by the Open Science special interest group.

Previous Positions

09/14 – 05/17 **Center for Imaging Science, Johns Hopkins University** Baltimore, MD
Research Engineer
Development and maintenance of an open-source pipeline for structural connectome estimation in humans and implemented statistical algorithms for quality control of data derivatives. Publicly released data products to lower the barrier to entry for neuroscience research. Chiefly responsible for grant reporting and public presence at conferences and workshops.

06/13 – 09/13 **Dept. of Systems and Computer Engineering, Carleton University** Ottawa, ON
Research Assistant with Dr. Rafik Goubran
Developed wireless medical data publish-subscribe system for viewing patient vital signs remotely.

06/12 – 09/12 **Dept. of Systems and Computer Engineering, Carleton University** Ottawa, ON
Research Assistant with Dr. Andy Adler
Utilized neural networks for inverse modeling of real and simulated biological systems.

06/11 – 09/11 **Dept. of Biology, Carleton University** Ottawa, ON
Research Assistant with Dr. Jeffrey Dawson
Developed robotics platform for studying insect locomotion patterns and behaviour.

01/09 – 09/09 **CRC, Ottawa Hospital Research Institute** Ottawa, ON
Research Assistant with Dr. Jim Dimitroulakos
Tested combination therapies of Lovastatin and Cisplatin drugs on colon and breast cancer strains.

Teaching Experience

05/17 – now **McGill University, OHBM, Brainhack School, Brain Intensive, others** Montreal, QC
Neuroinformatics Instructor
Regularly plan and teach a series of workshop introducing neuroscientists and trainees to methods in neuroinformatics. Developed and publicly released all course content on GitHub under the "Brainhack101" moniker and several videos on YouTube under the "BrainIntensive" profile.

09/14 – 05/17 **Dept. of Biomedical Engineering, Johns Hopkins University** Baltimore, MD
Teaching Assistant
Responsible for instruction, evaluation, and content design for: Freshman Modeling and Design for BME (2014, 2015), Systems and Controls (2015), Statistical Connectomics (2015), The Art of Data Science (2016), NeuroData Design (2016). Spent more than 500 hours working with students.

01/{15, 16, 17} **Dept. of Computer Science, Johns Hopkins University** Baltimore, MD
Instructor
Responsible for instruction, evaluation, and content design for intensive 3-week project-based course on an introduction to connectomics research across multiple scales and experimental modalities. Spent more than 300 hours planning, designing course content, and working with students.

09/12 – 05/14 **Student Academic Success Center, Carleton University** Ottawa, ON
Facilitator for Peer-Assisted Study Sessions
Instructed and demonstrated mastery of principles in electromagnetism and power engineering. Spent more than 300 hours working with students.

08/13 – 05/14	Student Academic Success Center, Carleton University <i>Facilitator Team Leader</i> Provided training, mentoring, and coaching to student instructors in a variety of disciplines. Spent more than 100 hours training and working with facilitators.	Ottawa, ON
01/13 – 06/14	Dept. of Systems and Computer Engineering, Carleton University <i>Teaching Assistant</i> Instructed introductory level C++ programming. Led lab sessions and instructional workshops. Spent more than 300 hours working with students.	Ottawa, ON

memberships & extracurriculars

2020 – now	XSEDE, NSF XSEDE Review Allocation Committee Member	Alexandria, VA
2017 – now	OHBM Open Science SIG Treasurer, Educational Committee Liaison	Minneapolis, MN
2017 – now	Canadian Open Neuroscience Platform Training Committee Trainee Representative	Montreal, QC
2017 – now	Various Neuroinformatics-based Hackathons and Courses Hackathon Chair, Organizer, & Instructor	Montreal, QC
2018 – 2019	Ludmer Centre Seeds of Change Campaign Trainee Ambassador	Montreal, QC
2017 – 2018	OHBM Open Science SIG Hackathon Chair	Minneapolis, MN
2017 – 2018	Healthy Brains for Healthy Lives Trainee Committee President (Neuroinformatics)	Montreal, QC
2014 – 2017	NeuroData Neurocartographer	Baltimore, MD
2015 – 2017	College Prep Program College Mentor, SAT Coach, & Essay Reviewer	Baltimore, MD
2014 – 2016	Thread Grandparent (i.e. supervisor) & Family Member (i.e. mentor)	Baltimore, MD
2013 – 2014	Carleton University Biomedical Engineering Society President	Ottawa, ON
12/12, 12/13	Operation Red Nose Ottawa Navigator and Driver	Ottawa, ON
2010 – 2011	Carleton University Student Emergency Response Team Emergency First Responder	Ottawa, ON

awards

2019	Young Investigator Award	Sage Bionetworks, Seattle, WA
2019	Instructor Training Fellowship	Repronim, Worcester, MA
2019	Globalink Research Award	Mitacs, Montreal, QC
2018	Michael Smith Foreign Study Supplement	NSERC, Ottawa, ON
2018	Alexander Graham Bell Canada Graduate Scholarship (CGS D)	NSERC, Ottawa, ON
2017	Healthy Brains for Healthy Lives Doctoral Fellowship	McGill University, Montreal, QC
2017	CRN Coding Sprint Project Award	Stanford University, Palo Alto, CA
2017	OHBM BrainHack Travel Award	OHBM, Minneapolis, MN
2014 – 2016	Full-tuition Master's Degree Fellowship	Johns Hopkins University, Baltimore, MD
2014	Graduated with Distinction	Carleton University, Ottawa, ON
2014	Greatest Social Impact Paper	Professional Engineering Ontario (PEO), Ottawa, ON
2014	SEED Fund	Carleton University Engineering Alumni, Ottawa, ON
2014	IEEE Papers Showcase Local Winner	IEEE Ottawa-Carleton Chapter, Ottawa, ON
2014	Carleton Electronics Project Competition Champion	Carleton University, Ottawa, ON
2013	Engineering '65 and '66 Scholarship	Carleton University, Ottawa, ON
2012 – 2014	Dean's Honour List	Carleton University, Ottawa, ON
2012	Clarence C. Gibson Scholarship	Carleton University, Ottawa, ON

interests

professional: reproducibility, accessibility, high performance computing, neuroscience, pipeline engineering, big data, data analysis, software design, machine learning, statistics. **personal:** guitar, hockey, soccer, design, hiking, paddling.

reviewed for

1. Cluster Computing
2. Extreme Science and Engineering Discovery Environment (XSEDE)
3. Frontiers in Neuroinformatics
4. Gigascience
5. Journal of Open Source Software

publications

pre-prints

1. Optimal Experimental Design for Big Data: Applications in Brain Imaging
E. W. Bridgeford, S. Wang, Z. Yang, Z. Wang, T. Xu, C. Craddock, **G. Kiar**, W. Gray-Roncal, C. E. Priebe, B. Caffo, M. Milham, X .N. Zuo, Consortium for Reliability and Reproducibility, J .T. Vogelstein

bioRxiv (Oct. 2019) p. 802629.

2. Comparing Perturbation Models for Evaluating Stability of Post-Processing Pipelines in Neuroimaging
G. Kiar, P. Oliveira Castro, P. Rioux, E. Petit, S. T. Brown, A. C. Evans, T. Glatard
(Aug. 2019).

articles in peer-reviewed journals

1. Brain status modeling with non-negative projective dictionary learning
M. Zhang, C. Desrosiers, Y. Guo, B. Khundrakpam, N. Al-Sharif, **G. Kiar**, P. Valdes-Sosa, J. B. Poline, A. C. Evans
Neuroimage (Oct. 2019) p. 116226.
2. PyBIDS: Python tools for BIDS datasets
T. Yarkoni, C. Markiewicz, A. Vega, K. Gorgolewski, T. Salo, Y. Halchenko, Q. McNamara, K. DeStasio, J. B. Poline, D. Petrov, V. Hayot-Sasson, D. Nielson, J. Carlin, **G. Kiar**, K. Whitaker, E. DuPre, A. Wagner, L. Tirrell, M. Jas, M. Hanke, R. Poldrack, O. Esteban, S. Appelhoff, C. Holdgraf, I. Staden, B. Thirion, D. Kleinschmidt, J. Lee, M. Castello, M. Notter, R. Blair
JOSS 4.40 (Aug. 2019) p. 1294.
3. A Serverless Tool for Platform Agnostic Computational Experiment Management
G. Kiar, S. T. Brown, T. Glatard, A. C. Evans
Frontiers in Neuroinformatics 13 (Mar. 2019) p. 12.
4. Container-Based Clinical Solutions for Portable and Reproducible Image Analysis
J. Matelsky, **G. Kiar**, E. Johnson, C. Rivera, M. Toma, W. Gray-Roncal
Journal of Digital Imaging 31.3 (May 2018) pp. 315–320. Springer Nature.
5. Boutiques: a flexible framework to integrate command-line applications in computing platforms
T. Glatard, **G. Kiar**, T. Aumentado-Armstrong, N. Beck, P. Bellec, R. Bernard, A. Bonnet, S. T. Brown, S. Camarasu-Pop, F. Cervenansky, S. Das, R. Ferreira da Silva, G. Flandin, P. Girard, K. J. Gorgolewski, C. R. G. Guttman, V. Hayot-Sasson, P. O. Quirion, P. Rioux, M. E. Rousseau, A. C. Evans
GigaScience 7.5 (Mar. 2018). Oxford University Press (OUP).
6. BIDS apps: Improving ease of use, accessibility, and reproducibility of neuroimaging data analysis methods
K.J. Gorgolewski, F. Alfaro-Almagro, T. Auer, P. Bellec, M. Capotă, M. M. Chakravarty, N. W. Churchill, A. L. Cohen, R. C. Craddock, G. A. Devenyi, A. Eklund, O. Esteban, G. Flandin, J. S. Guntupalli, M. Jenkinson, A. Keshavan, **G. Kiar**, P. R. Raamana, D. Raffelt, C. J. Steele, P. O. Quirion, R. E. Smith, S. Strother, G. Varoquaux, T. Yarkoni, Y. Wang, R. A. Poldrack
13.3 (2017) e1005209. Public Library of Science.
7. Science In the Cloud (SIC): A use case in MRI Connectomics
G. Kiar, K. J. Gorgolewski, D. Kleissas, W. R. Gray Roncal, B. Litt, B. Wandell, R. A. Poldrack, M. Wiener, R. J. Vogelstein, R. Burns, J. T. Vogelstein
GigaScience gix013 (Mar. 2017).
8. To the Cloud! A Grassroots Proposal to Accelerate Brain Science Discovery
J. T. Vogelstein, B. Mensh, M. Häusser, N. Spruston, A. C. Evans, K. Kording, K. Amunts, C. Ebell, J. Muller, M. Telefont, S. Hill, S. P. Koushika, C. Cali, P. A. Valdés-Sosa, P. B. Littlewood, C. Koch, S. Saalfeld, A. Kepecs, H. Peng, Y. O. Halchenko, **G. Kiar**, M. M. Poo, J. B. Poline, M. P. Milham, A. P. Schaffer, R. Gidron, H. Okano, V. D. Calhoun, M. Chun, D. M. Kleissas, R. J. Vogelstein, E. Perlman, R. Burns, R. Hugarir, M. I. Miller
Neuron 92.3 (Nov. 2016) pp. 622–627. Elsevier, requested article.

9. Grand Challenges for Global Brain Sciences

J. T. Vogelstein, K. Amunts, A. Andreou, D. Angelaki, G. Ascoli, C. Bargmann, R. Burns, C. Cali, F. Chance, M. Chun, G. Church, H. Cline, T. Coleman, S. de La Rochefoucauld, W. Denk, A. Belen Elgoyhen, R. E. Cummings, A. Evans, K. Harris, M. Hausser, S. Hill, S. Inverso, C. Jackson, V. Jain, R. Kass, B. Kasthuri, **G. Kiar**, K. Kording, S. Koushika, J. Krakauer, S. Landis, J. Layton, Q. Luo, A. Marblestone, D. Markowitz, J. McArthur, B. Mensh, M. Milham, P. Mitra, P. Neskovic, M. Nicolelis, R. O'Brien, A. Oliva, G. Orban, H. Peng, A. Picchini-Schaffer, M. Picciotto, J.-B. Poline, M.-m. Poo, A. Pouget, S. Raghavachari, J. Roskams, T. Sejnowski, F. Sommer, N. Spruston, L. Swanson, A. Toga, R. J. Vogelstein, R. Yuste, A. Zador, R. Hugarir, M. Miller

ArXiv e-prints (Aug. 2016).

proceedings in international peer-reviewed conferences

1. Organization for Human Brain Mapping Open Science Hackathons: Accessible and Inclusive Neuroinformatics
E. DuPre*, **G. Kiar***, R. C. Craddock, K. J. Gorgolewski, F. Hoffstaedter, A. Keshavan, J. B. Poline, M. Visconti di Oleggio Castello, K. Whitaker, P. Bellec
2nd Workshop on Hacking and Making at Time-Bounded events (Jan. 2018). *Computer Human Interaction*.
2. Electric localization of weakly electric fish using neural networks
G. Kiar, Y. Mamatjan, J. Jun, L. Maler, A. Adler
Journal of Physics: Conference Series vol. 434 (May 2013).

book chapters

1. The Montreal Neurological Institute Ecosystem: Enabling Reproducible Neuroscience from Collection to Analysis in the Web
G. Kiar, C. Makowski, J. B. Poline, S. Das, A. C. Evans
(Nov. 2017) pp. 51–56. *Society for Neuroscience*.

invited talks & organized workshops

1. Evaluating the Stability of Neuroimaging Pipelines
National Institute of Mental Health (Feb. 2020), Presentation.
2. Comparing Perturbation Models for Evaluating Stability of Neuroimaging Pipelines
Computational Reproducibility at Exascale (Nov. 2019), Super Computing, Presentation.
3. From “Open Science” to “Science”: Shifting the status quo in data sharing, software, and publishing
Organization for Human Brain Mapping (June 2019), Symposium and presentation.
4. Introduction to Scientific Software Development and Machine Learning
Healthy Brains for Healthy Lives (Feb. 2019), McGill University, Workshop.
5. A FAIR Approach to Neuroimaging Analysis with Boutiques
Organization for Human Brain Mapping (June 2018), Presentation.
6. Connectome Coding: what is it, how do we do it, and why do we care?
Data science in Neuroscience Symposium (June 2018), Organization for Human Brain Mapping, Presentation.
7. OHBM Annual BrainHack & TrainTrack
Open Science Special Interest Group (June 2018), Organization for Human Brain Mapping, Workshop.
8. Brainhack Global: Montreal Edition
McGill University & Universite de Montreal (June 2018), Workshop.

9. A Data Driven Approach for Tackling Big Data Connectomics
Feindel Brain Imaging Lecture (Feb. 2018), Montreal Neurological Institute, Presentation.
10. Coding for Neuroscientists: An Introduction to Neuroscience Informatics
Graduate Student Association for Neuroscience (Jan. 2018), McGill University, Workshop.
11. BigNeuro 2017: Analyzing brain data from nano to macroscale
Neural Information Processing Systems (Dec. 2017), Workshop.
12. Enabling Accessible and Scalable Neuroscience
Healthy Brains For Healthy Lives (Nov. 2017), McGill University, Presentation.
13. Platforms for high performance computing in neuroscience
Neuroinformatics in the Age of Big Data: Working with the Right Data and Tools (Nov. 2017), Society for Neuroscience, Workshop.
14. Brainhack101 & Exploratory Data Analysis
Online Intensive for Brain Science: Computation and Imaging (Sept. 2017), National Institute of Health, Presentation.
15. CloudControl: Integrating Quality Control and Pipeline Deployment in the Cloud
Open Science Special Interest Group (June 2017), Organization for Human Brain Mapping, Presentation.
16. Open Science Session Chair
Open Science Special Interest Group (June 2017), Organization for Human Brain Mapping, Workshop.
17. Science in the Cloud (SIC): A use-case in MRI Connectomics
Open Science Special Interest Group (June 2017), Organization for Human Brain Mapping, Presentation.
18. Brain Hacking 101
Open Science Special Interest Group (June 2017), Organization for Human Brain Mapping, Presentation.
19. NeuroStorm: Accelerating Brain Science Discovery in the Cloud
Johns Hopkins University (June 2017), National Science Foundation, Workshop.

posters at international conferences

1. Enabling FAIR Scientific Tool Development, Dissemination, and Consumption with Boutiques
G. Kiar, E. Benderoff, J. Charrière, S. Dubé, L. O. Guérin, A. Bonnet, S. Camarasu-Pop, N. Beck, P. Rioux, S. Boroday, S. T. Brown, J. B. Poline, A. E. Evans, T. Glatard
Sage Assembly (July 2019).
2. A FAIR Approach to Neuroimaging Analysis with Boutiques
G. Kiar, E. Benderoff, J. Charrière, S. Dubé, L. O. Guérin, A. Bonnet, S. Camarasu-Pop, N. Beck, P. Rioux, S. Boroday, S. T. Brown, J. B. Poline, A. E. Evans, T. Glatard
Organization for Human Brain Mapping (June 2019).
3. Reverse Engineering the Human Connectome: Learning Function from Structure
L. E. Suarez, **G. Kiar**, R. A. Doyle, A. C. Evans, B. Misić
Resting State Brain Connectivity (Sept. 2018).
4. PIVT: A Platform Independent Visualization Tool
A. Taheri, J. Lurie, R. Abou-Haidar, S. T. Brown, S. Das, A. Doyle, N. Khalili-Mahani, **G. Kiar**, P. Kostopoulos, C. Lepage, L. Lewis, C. Makowski, C. Rogers, P. Toussaint, A. C. Evans
Organization for Human Brain Mapping (June 2018).

5. Pybids: Python tools for manipulation and analysis of BIDS datasets
T. Yarkoni, A. de la Vega, E. DuPre, O. Esteban, Y. Halchenko, M. Hanke, V. Hayot-Sasson, A. Ivanov, **G. Kiar**, C. Markiewicz, Q. McNamara, D. Petrov, J. B. Poline, R. Poldrack, K. J. Gorgolewski
Organization for Human Brain Mapping (June 2018).
6. A Principled Approach to Statistical Connectomics and Mega-Analysis
E. Bridgeford, **G. Kiar**, V. Chandrashekhar, C. Shen, C. E. Gray Roncal, B. Caffo, J. Vogelstein
Organization for Human Brain Mapping (June 2018).
7. Exploring whole-brain structural connectivity and cognitive performance in typical development
N. Al-Sharif, **G. Kiar**, B. Khundrakpam, A. C. Evans
Organization for Human Brain Mapping (June 2018).
8. Clowdr: a micro-service model for scalable, reproducible, and accessible neuroinformatics
G. Kiar, T. Glatard, S. T. Brown, A. C. Evans
Organization for Human Brain Mapping (June 2018).
9. Creativity is Unrelated to Intelligence and Personality: A Machine Learning Study
A. Doyle, **G. Kiar**, P. Toussaint, P. Lemaître, A. C. Evans
Organization for Human Brain Mapping (June 2018).
10. An Extensible Application Programming Interface for Querying Distributed Neuroscience Datasets
G. Kiar, T. Glatard, J. B. Poline
Organization for Human Brain Mapping (June 2018).
11. Heterogeneous tau-PET signal in the hippocampus resolves discrepancies between imaging and pathology
J. Vogel, R. Ossenkoppele, **G. Kiar**, O. Hansson, A. C. Evans
Organization for Human Brain Mapping (June 2018).
12. Numerical error propagation in the HCP structural pre-processing pipelines
A. Salari, L. Scaria, **G. Kiar**, T. Glatard
Organization for Human Brain Mapping (June 2018).
13. BIDS apps: Improving ease of use, accessibility, and reproducibility of neuroimaging data analysis methods
K.J. Gorgolewski, F. Alfaro-Almagro, T. Auer, P. Bellec, M. Capotă, M. M. Chakravarty, N. W. Churchill, A. L. Cohen, R. C. Craddock, G. A. Devenyi, A. Eklund, O. Esteban, G. Flandin, J. S. Guntupalli, M. Jenkinson, A. Keshavan, **G. Kiar**, P. R. Raamana, D. Raffelt, C. J. Steele, P. O. Quirion, R. E. Smith, S. Strother, G. Varoquaux, T. Yarkoni, Y. Wang, R. A. Poldrack
Organization for Human Brain Mapping (June 2017).
14. MR Graph with Rich attribUTES DataBase (Mr. GruteDB)
G. Kiar, W. R. Gray Roncal, D. Mhembere, E. W. Bridgeford, S. Wang, C. E. Priebe, R. Burns, J. T. Vogelstein
Organization for Human Brain Mapping (June 2016).
15. The Open Connectome Project & NeuroData: Enabling Data Driven Neuroscience at Scale
Joshua T. Vogelstein, et al.
Society for Neuroscience (Oct. 2015).
16. Community Connectomics via Cloud Computing Utilizing m2g: a Reference Pipeline
G. Kiar, W. R. Gray Roncal, D. Mhembere, E. W. Bridgeford, D. Clark, M. P. Milham, R. C. Craddock, R. Burns, J. T. Vogelstein
Organization for Human Brain Mapping (June 2015).

published code

For an up-to-date list of published code projects, please visit my GitHub profile at <https://github.com/gkiar>.