gregorykiar

biomedical engineer

contact

3801 University Street
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languages

english native speaker,
basic ASL

programming

Python, R, AWS ♥
MATLAB, C++, x86,
Ruby, LaTeX

soft skills

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

education

2017 – now **PhD student** in Biomedical Engineering — McGill University, Montreal, QC
Thesis work supervised by Alan Evans and Tristan Glatard on a project entitled: Characterizing and Optimizing Generalizability and Accuracy in Neuroimaging Through Repeated Provenance-rich Analysis. 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 accessible 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
Responsible for the integration of distributed software software services with high performance computing clouds and clusters. Provided development, training, and support towards the use of tools and services within international collaborations.

05/17 – now **Organization for Human Brian Mapping (OHBM)** — Minneapolis, MN
Open Science Special Interest Group Hackathon Chair
Responsible for organizing and planning an introductory neuroinformatics course for neuroscientists, BrainHack 101, an international “hackathon” style event for collaborative neuroinformatics training and project development, and curation of unconference activities related to the open science special interest group before and throughout the annual OHBM meeting.

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, Brain Intensive, Universite de Montreal, 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** Ottawa, ON

Facilitator Team Leader

Provided training, mentoring, and coaching to student instructors in a variety of disciplines. Spent more than 100 hours training and working with facilitators.

01/13 – 06/14 **Dept. of Systems and Computer Engineering, Carleton University** Ottawa, ON

Teaching Assistant

Instructed introductory level C++ programming. Led lab sessions and instructional workshops. Spent more than 300 hours working with students.

memberships & extracurriculars

2018 – 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
2017 – now	**OHBM Open Science SIG** Hackathon Chair & Committe Member	Minneapolis, MN
2017 – 2018	**Healthy Brains for Healthy Lives Trainee Committee** President (Neuroinformatics)	Montreal, QC
2014 – 2017	**NeuroData** Chief 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
2013 – 2014	**PASS Talks** Co-Founder and Vice 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

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. Frontiers in Neuroinformatics

publications

pre-prints

1. A High-Throughput Pipeline Identifies Robust Connectomes But Troublesome Variability
   G. Kiar, E. W. Bridgeford, W. R. Gray Roncal, V. Chandrashekhar, D. Mhembere, S. Ryman, X. N. Zuo, D. S. Marguiles, R. C. Craddock, C. E. Priebe, R. Jung, V. D. Calhoun, B. Caffo, R. Burns, M. P. Milham, J. T. Vogelstein
   bioRxiv (2018). Cold Spring Harbor Laboratory.

2. Boutiques: a flexible framework for automated application integration in computing platforms
   T. Glatard, **G. Kiar**, T. Aumentado-Armstrong, N. Beck, P. Bellec, R. Bernard, A. Bonnet, S. Camarasu-Pop, F. Cervenansky, S. Das, R. Ferreira da Silva, G. Flandin, P. Girard, K. J. Gorgolewski, C. R. G. Guttmann, V. Hayot-Sasson, P.-O. Quirion, P. Rioux, M.-E. Rousseau, A. C. Evans
   ArXiv e-prints (Nov. 2017).

articles in peer-reviewed journals

1. 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.

2. 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.

3. 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).

4. 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. Huganir, M. Miller
   ArXiv e-prints (Aug. 2016).

5. 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. Calı, 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. Huganir, M. I. Miller
   Neuron 92.3 (Nov. 2016) pp. 622–627. Elsevier, requested article.

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. A Data Driven Approach for Tackling Big Data Connectomics
   Feindel Brain Imaging Lecture (Feb. 2018).

2. Coding for Neuronerds: An Introduction to Neuroscience Informatics
   Graduate Student Association for Neuroscience (Jan. 2018).

3. BigNeuro 2017: Analyzing brain data from nano to macroscale
   Neural Information Processing Systems Workshop (Dec. 2017).

4. Brain Hacking 101
   Organization for Human Brain Mapping Open Science Room (June 2017).

5. Brainhack101 & Exploratory Data Analysis
   Online Intensive for Brain Science: Computation and Imaging (Sept. 2017).

6. ClowdControl: Integrating Quality Control and Pipeline Deployment in the Cloud
   Organization for Human Brain Mapping Open Science Room (June 2017).

7. Enabling Accessible and Scalable Neuroscience
   Healthy Brains For Healthy Lives (Nov. 2017).

8. NeuroStorm: Accelerating Brain Science Discovery in the Cloud
   Johns Hopkins University (June 2017).

9. Open Science Session Chair
   Organization for Human Brain Mapping Open Science Room (June 2017).

10. Platforms for high performance computing in neuroscience
    Neuroinformatics in the Age of Big Data: Working with the Right Data and Tools (Nov. 2017).

11. Science in the Cloud (SIC): A use-case in MRI Connectomics
    Organization for Human Brain Mapping Open Science Room (June 2017).

posters at international conferences

1. 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).

2. Creativity is Unrelated to Intelligence and Personality: A Machine Learning Study
   A. Doyle, **G. Kiar**, P. Toussaint, P. Lemaitre, A. C. Evans
   Organization for Human Brain Mapping (June 2018).

3. 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).

4. An Extensible Application Programming Interface for Querying Distributed Neuroscience Datasets
   G. Kiar, T. Glatard, J. B. Poline
   Organization for Human Brain Mapping (June 2018).

5. 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).

6. 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).

7. 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).

8. 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).

9. 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).

10. 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).

11. 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).

12. 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).

13. The Open Connectome Project & NeuroData: Enabling Data Driven Neuroscience at Scale
    Joshua T. Vogelstein, et al.
    Society for Neuroscience (Oct. 2015).

published code

1. Clowdr: Accessible pipeline deployment and sharing
   G. Kiar
   (Mar. 2018).

2. Boutiques: A descriptive command-line framework
   T. Glatard, **G. Kiar**, T. Aumentado-Armstrong, N. Beck, R. Ferreira da Silva, M. E. Rousseau
   Zenodo (Sept. 2017).

3. Example use case of SIC with the ndmg pipeline (SIC:ndmg)
   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
   (2017). GigaScience Database.

4. ndmg: NeuroData's MRI Graphs pipeline
   G. Kiar, W. R. Gray Roncal, D. Mhembere, E. W. Bridgeford, R. Burns, J. T. Vogelstein
   Zenodo (Aug. 2016).