

# gregorykiar

biomedical engineer



## contact

3801 University Street  
NW 144/145  
Montreal, Quebec  
H3A 2B4, Canada

gkiar07@gmail.com 


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 **PhD 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, 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 | <b>Student Academic Success Center, Carleton University</b><br><i>Facilitator Team Leader</i><br>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 | <b>Dept. of Systems and Computer Engineering, Carleton University</b><br><i>Teaching Assistant</i><br>Instructed introductory level C++ programming. Led lab sessions and instructional workshops. Spent more than 300 hours working with students.               | Ottawa, ON |

## memberships & extracurriculars

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

## awards

|      |  |                                    |
|------|--|------------------------------------|
| 2019 | <b>Globalink Research Award</b>                                  | Mitacs, Montreal, QC               |
| 2018 | <b>Michael Smith Foreign Study Supplement</b>                    | NSERC, Ottawa, ON                  |
| 2018 | <b>Alexander Graham Bell Canada Graduate Scholarship (CGS D)</b> | NSERC, Ottawa, ON                  |
| 2017 | <b>Healthy Brains for Healthy Lives Doctoral Fellowship</b>      | McGill University, Montreal, QC    |
| 2017 | <b>CRN Coding Sprint Project Award</b>                           | Stanford University, Palo Alto, CA |

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| 2017        | <b>OHBM BrainHack Travel Award</b>                       | OHBM, Minneapolis, MN                              |
| 2014 – 2016 | <b>Full-tuition Master's Degree Fellowship</b>           | Johns Hopkins University, Baltimore, MD            |
| 2014        | <b>Graduated with Distinction</b>                        | Carleton University, Ottawa, ON                    |
| 2014        | <b>Greatest Social Impact Paper</b>                      | Professional Engineering Ontario (PEO), Ottawa, ON |
| 2014        | <b>SEED Fund</b>   | Carleton University Engineering Alumni, Ottawa, ON |
| 2014        | <b>IEEE Papers Showcase Local Winner</b>                 | IEEE Ottawa-Carleton Chapter, Ottawa, ON           |
| 2014        | <b>Carleton Electronics Project Competition Champion</b> | Carleton University, Ottawa, ON                    |
| 2013        | <b>Engineering '65 and '66 Scholarship</b>               | Carleton University, Ottawa, ON                    |
| 2012 – 2014 | <b>Dean's Honour List</b>                                | Carleton University, Ottawa, ON                    |
| 2012        | <b>Clarence C. Gibson Scholarship</b>                    | 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
2. Gigascience

## publications

### pre-prints

1. A Serverless Tool for Platform Agnostic Computational Experiment Management  
**G. Kiar**, S. T. Brown, T. Glatard, A. C. Evans  
*arXiv preprint arXiv:1809.07693* (2018).
2. 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.

### 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. 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. Guttmann, V. Hayot-Sasson, P. O. Quirion, P. Rioux, M. E. Rousseau, A. C. Evans  
*GigaScience* 7.5 (Mar. 2018). Oxford University Press (OUP).

3. 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.

4. 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).

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. 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.

6. 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. 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.

2. OHBM Annual BrainHack & TrainTrack

*Open Science Special Interest Group* (June 2018), Organization for Human Brain Mapping.

3. Brainhack Global: Montreal Edition

*Brainhack* (June 2018), McGill University & Université de Montreal.

4. A Data Driven Approach for Tackling Big Data Connectomics

*Feindel Brain Imaging Lecture* (Feb. 2018), Montreal Neurological Institute.

5. Coding for Neuroners: An Introduction to Neuroscience Informatics

*Graduate Student Association for Neuroscience* (Jan. 2018), McGill University.

6. BigNeuro 2017: Analyzing brain data from nano to macroscale

*NIPS Workshop* (Dec. 2017), Neural Information Processing Systems.

7. Enabling Accessible and Scalable Neuroscience

*Healthy Brains For Healthy Lives* (Nov. 2017), McGill University.

8. 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.

9. Brainhack101 & Exploratory Data Analysis

*Online Intensive for Brain Science: Computation and Imaging* (Sept. 2017), National Institute of Health.

10. CloudControl: Integrating Quality Control and Pipeline Deployment in the Cloud

*Open Science Special Interest Group* (June 2017), Organization for Human Brain Mapping.

11. Open Science Session Chair

*Open Science Special Interest Group* (June 2017), Organization for Human Brain Mapping.

12. Science in the Cloud (SIC): A use-case in MRI Connectomics

*Open Science Special Interest Group* (June 2017), Organization for Human Brain Mapping.

13. Brain Hacking 101

*Open Science Special Interest Group* (June 2017), Organization for Human Brain Mapping.

14. NeuroStorm: Accelerating Brain Science Discovery in the Cloud

*Johns Hopkins University* (June 2017), National Science Foundation.

## posters at international conferences

1. 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).

2. 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).

3. 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).

4. 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).
5. 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).
6. 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).
7. 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).
8. An Extensible Application Programming Interface for Querying Distributed Neuroscience Datasets  
**G. Kiar**, T. Glatard, J. B. Poline  
*Organization for Human Brain Mapping* (June 2018).
9. 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).
10. 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).
11. 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).
12. 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).
13. The Open Connectome Project & NeuroData: Enabling Data Driven Neuroscience at Scale  
Joshua T. Vogelstein, et al.  
*Society for Neuroscience* (Oct. 2015).
14. 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

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

2. 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.

3. 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).

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).