

gregorykiar

Research Scientist, Child Mind Institute

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education

- 2017–2021 **Ph.D. in Biomedical Engineering** McGill University, Montréal, QC
Thesis work supervised by Alan Evans and Tristan Glatard on a project entitled:
This is Your Brain on Disk: The Impact of Numerical Instabilities in Neuroscience.
Project involved the development of high performance computing infrastructures, the instrumentation and perturbation of neuroimaging pipelines, the evaluation of perturbations in an analytic context, and the application of perturbed derivatives towards data augmentation in machine learning applications. 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

research

- 04/21 – now **Child Mind Institute — Center for Data Analytics, Innovation, and Rigor** New York City, NY
Director, Research Scientist (Senior Scientist Track)
I lead three independent teams in i) neuroimaging software development, ii) computational neuroscience and quantitative psychiatry research, and iii) the translation of software engineering and applied machine learning to the clinic. Across each of these teams, my groups produce tools and resources that support neuroscience through high performance computing, the application of computational statistics, and the incorporation of machine learning tools.
I develop and execute research programs, obtain funding from both governmental organizations and private foundations, and communicate scholarly outputs to the community. My research projects involve evaluating and improving the trustworthiness of tools and techniques used to study the brain and mental health, to inform decision making surrounding

robust data collection, data processing, and ultimately biomarker discovery.

Notable achievements include: i) obtaining and NIH R01 award on first submission at the age of 29, ii) building and managing a Center consisting of three distinct teams and 15 individual contributors working on over 30 distinct projects and with a 7-figure annual budget, iii) designing and building the Multimodal Brain/Body Imaging Core at the Child Mind Institute (1x Project Manager, 6x PhD-level scientists, 6x Analysts) in 6 months, iv) publishing several first- and senior-authors works in high profile outlets.

- 05/17–04/21 **McGill University — McGill Centre for Integrative Neuroscience** Montréal, QC
Software Developer & Researcher (w/ Dr. Alan C. Evans)
Responsible for the exploration and integration of distributed software services with high performance computing clouds and clusters. Provided software development, training, and support towards the use of analysis tools and services within international collaborations. Focused on the development of methods for evaluating the trustworthiness and stability of neuroimaging tools and experiments.
- 04/19–07/19 **INRIA Rennes, Bretagne Atlantique — Empenn Lab** Rennes, France
Research Intern (w/ Dr. Camille Maumet)
Developed web crawler to scrape public neuroimaging databases for processed functional activation maps. Constructed workflow for metadata-based QC at scale with 10,000s of samples. Designed a convolutional neural network for the identification of consensus activation maps across populations.
- 09/14–05/17 **Johns Hopkins University — Center for Imaging Science** Baltimore, MD
Research Engineer (w/ Dr. Joshua T. Vogelstein)
Developed and maintained 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. Was chiefly responsible for grant reporting and presentations at conferences and workshops.
- 06/13–05/17 **Carleton University — Dept. of Systems and Computer Engineering** Ottawa, ON
Research Assistant (w/ Dr. Rafik Goubran)
Developed wireless medical data publish-subscribe system for viewing patient vital signs.
- 06/12–09/12 **Carleton University — Dept. of Systems and Computer Engineering** Ottawa, ON
Research Assistant (w/ Dr. Andy Adler)
Developed neural networks for inverse modeling of real and simulated biological systems.
- 06/11–09/11 **Carleton University — Dept. of Biology** Ottawa, ON
Research Assistant (w/ Jeffrey Dawson)
Developed a robotics platform for studying insect locomotion patterns and behavior.
- 01/09–09/09 **Ottawa Hospital Research Institute — Cancer Research Center** Ottawa, ON
Research Assistant (w/ Dr. Jim Dimitroulakos)
Tested combination therapies of Lovastatin+Cisplatin drugs on colon and breast cancer strains.

teaching

- 01/19–01/20 **Concordia University — Continuing Education** Montréal, QC
Instructor & Curriculum Developer
Was responsible for the training of working professionals in the basics of "Big Data

Technology," including fundamental tools for software development such as Unix, Git, and Docker, and software for numerical analysis such as Python and R. Was a core contributor in the development of courses within the "Big Data Solutions for Business" diploma program.

05/17–05/21 **McGill University, OHBM, Brainhack School, Brain Intensive** Montréal, QC
Neuroinformatics Instructor

Regularly planned and taught a series of workshops introducing neuroscientists and trainees to methods in neuroinformatics. Developed and publicly released all course content on GitHub under "Brainhack101" and "BrainIntensive" communities.

04/19–07/19 **Johns Hopkins University — Department of Biomedical Engineering** Baltimore, MD
Teaching Assistant

Was 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 > 500 hours with students.

01/15,16,17 **Johns Hopkins University — Center for Imaging Science** Baltimore, MD
Instructor

Was responsible for instruction, evaluation, and content design for an intensive 3-week project-based course on an introduction to connectomics research across multiple scales and experimental modalities. Spent > 300 hours planning, designing content, and with students.

09/12–05/14 **Carleton University — Student Academic Success Centre** Ottawa, ON
Facilitator for Peer-Assisted Study Sessions

Instructed and demonstrated mastery of principles in electromagnetism and power engineering. Spent > 300 hours with students.

08/13–05/14 **Carleton University — Student Academic Success Centre** Ottawa, ON
Facilitator Team Leader

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

01/13–05/14 **Carleton University — Dept. of Systems and Computer Engineering** Ottawa, ON
Teaching Assistant

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

funding

grants

2023–2028 **National Institutes of Health — NIMH 1R01MH133334** \$3,685,297.00 USD
A Mega-Analysis Framework for Delineating Autism Neurosubtype
PI: Adriana di Martino Role: Co-Investigator

2022–2025 **National Institutes of Health — NIMH 1RF1MH130859** \$1,504,004.00 USD
Improving the robustness of neuroimaging through variability in processing pipelines
PI: Gregory Kiar

2022–2024 **National Science Foundation — XSEDE/ACCESS MED220009** \$117,077.80 USD
Preprocessing and sharing of large-scale open neuroimaging datasets

PI: Gregory Kiar

2022–2023	National Science Foundation — XSEDE/ACCESS BIO220056 Mapping Large-scale Brain Development between Human and Nonhuman Primate PI: Ting Xu Role: Co-Investigator	\$30,786.95 USD
2021–2023	Michael J. Fox Foundation Improving the generalizability and robustness of MRI-derived biomarker of Parkinson's Disease through analytical and data variability evaluations PI: Tristan Glatard Role: Consultant	\$305,254.00 USD
2018–2021	NSERC Canada — CGSD3-519497-2018 Supporting scalable computing in neuroimaging for the exploration of numerical instabilities PI/Scholar: Gregory Kiar	\$105,000.00 CAD

awards

2020	Canadian Open Neuroscience Platform — Research Scholar Award	\$25,000 CAD
2019	Sage Bionetworks — Young Investigator Award	\$1,000 USD
2019	Repronim — Instructor Training Fellowship	\$1,000 USD
2019	Mitacs Canada — Globalink Research Award	\$6,000 CAD
2018	NSERC Canada — Michael Smith Foreign Study Supplement	\$5,200 CAD
2017	McGill University — Healthy Brains for Healthy Lives Doctoral Fellowship	\$15,000 CAD
2017	Stanford University — CRN Coding Sprint Project Award	\$2,000 USD
2017	Organization for Human Brain Mapping — Brainhack Travel Award	\$5000 USD
2014–2016	Johns Hopkins University — Full Tuition Master's Degree Fellowship	\$100,000 USD
2014	Carleton University — Graduated with Distinction	
2014	Professional Engineering Ontario — Greatest Social Impact Paper	\$500 CAD
2014	Carleton University Engineering Alumni — Capstone SEED Fund	\$800 CAD
2014	IEEE Ottawa-Carleton Chapter — IEEE Papers Showcase Local Winner	\$500 CAD
2014	Carleton University — Electronics Project Competition Champion	
2013	Carleton University — Engineering '65 and '66 Scholarship	\$2,000 CAD
2012	Carleton University — Clarence C. Gibson Scholarship	\$2,000 CAD

memberships & extracurriculars

2021–now	NMIND Consortium — Lead Investigator	Global
2017–now	Various Neuroinformatics Hackathons — Instructor & Organizer	Global
2020–2022	NSF XSEDE — XSEDE Review Allocation Committee Member	Alexandria, VA
2020	NSF XSEDE — COVID-19 HPC Consortium Allocation Reviewer	Global
2017–2020	Canadian Open Neuroscience Platform — Trainee Committee Representative	Montréal, QC
2017–2020	Organization for Human Brain Mapping Open Science SIG — Treasurer	Minneapolis, MN

2018–2019	Ludmer Centre — <i>Seeds of Change Student Champion</i>	Montréal, QC
2017–2018	Organization for Human Brain Mapping — <i>Hackathon Chair</i>	Minneapolis, MN
2017–2018	Healthy Brains for Healthy Lives Trainee Committee — <i>President</i>	Montréal, QC
2015–2017	College Prep Program — <i>College Mentor, SAT Coach, Essay Reviewer</i>	Baltimore, MD
2014–2016	Thread — <i>Volunteer supervisor ("grandparent"), Student Mentor ("family")</i>	Baltimore, MD
2013–2014	Carleton University Biomedical Engineering Society — <i>President</i>	Ottawa, ON
2010–2011	Carleton University Student Emergency Response Team — <i>First Responder</i>	Ottawa, ON

supervision & mentorship

1. Laura Newman (Project Coordinator, Child Mind Institute; 2024–)
2. Jason Kai (Postdoctoral Fellow, Child Mind Institute; 2024–)
3. Gabriel Schubiner (Data Engineer, Child Mind Institute; 2024–)
4. Azaadeh Goharзад (Scientific Software and Engineering Generalist, Child Mind Institute; 2024–)
5. David Lobue (Senior Machine Learning Engineer, Child Mind Institute; 2024–)
6. Mina Alizadeh (PhD Student, Comp. Sci., Concordia University; 2022–)
7. Reinder Vos de Wael (Senior Scientific Software Developer, Child Mind Institute; 2023–)
8. Nathalia Bianchini Esper (Postdoctoral Fellow, Child Mind Institute; 2022–)
9. Elizabeth Kenneally (Software Developer, Child Mind Institute; 2022–)
10. Connor Lane (Software Developer, Child Mind Institute; 2022–)
11. Maya Roberts (Data Analyst, Child Mind Institute; 2022–)
12. Florian Rupprecht (Software Developer, Child Mind Institute; 2022–)
13. Steven Giavasis (Lead Software Developer, Child Mind Institute; 2022–)
14. Jon Clucas (Software Developer, Child Mind Institute; 2021–)
15. Amy Gutierrez (Software Developer, Child Mind Institute; 2021–2023)
16. Teresa George (Software Developer, Child Mind Institute; 2021–2023)
17. Xinhui Li (Software Developer, Child Mind Institute; 2021–2022)
18. Ali Salari (PhD Student, Comp. Sci., Concordia University; via Tristan Glatard; 2019–2022)
19. Hamidreza Heidarzadeh (MSc, Comp. Sci., Concordia University; via Tristan Glatard; 2018–2019)

reviewed for

1. Aperture (Organization for Human Brain Mapping)
2. COVID-19 High Performance Computing Consortium (NSF)
3. Biological Psychiatry (Elsevier)
4. Cluster Computing (Springer)
5. Extreme Science and Engineering Discovery Environment (NSF)
6. Frontiers in Neuroinformatics (Frontiers)
7. Gigascience (Oxford University Press)
8. Journal of Open Source Software

9. Medical Image Analysis (Elsevier)
10. Nature Communications Biology (Nature Publishing)
11. Nature Scientific Data (Nature Publishing)
12. Neuroimage (Elsevier)
13. Neuroscience and Biobehavioral Reviews (Science Direct)
14. Practice & Experience in Advanced Research Computing Conference (NSF)
15. Scipy Conference

publications

pre-prints

1. Lane, C., & Kiar, G. (2023). A Parameter-efficient Multi-subject Model for Predicting fMRI Activity. In *arXiv [cs.CV]*. arXiv. <http://arxiv.org/abs/2308.02351>

articles in peer-reviewed journals

1. Kiar, G., Mumford, J. A., Xu, T., Vogelstein, J. T., Glatard, T., & Milham, M. P. (2024). Why experimental variation in neuroimaging should be embraced. *Nature Communications*, 15(1), 9411.
2. Li, X., Bianchini Esper, N., Ai, L., Giavasis, S., Jin, H., Feczko, E., Xu, T., Clucas, J., Franco, A., Sólón Heinsfeld, A., Adebimpe, A., Vogelstein, J. T., Yan, C.-G., Esteban, O., Poldrack, R. A., Craddock, C., Fair, D., Satterthwaite, T., Kiar, G., & Milham, M. P. (2024). Moving beyond processing- and analysis-related variation in resting-state functional brain imaging. *Nature Human Behaviour*, 1–15.
3. Chatelain, Y., Tetrel, L., Markiewicz, C. J., Goncalves, M., Kiar, G., Esteban, O., Bellec, P., & Glatard, T. (2024). A numerical variability approach to results stability tests and its application to neuroimaging. *IEEE Transactions on Computers*, 1–10.
4. Luo, A. C., Sydnor, V. J., Pines, A., Larsen, B., Alexander-Bloch, A. F., Cieslak, M., Covitz, S., Chen, A. A., Esper, N. B., Feczko, E., Franco, A. R., Gur, R. E., Gur, R. C., Houghton, A., Hu, F., Keller, A. S., Kiar, G., Mehta, K., Salum, G. A., ... Satterthwaite, T. D. (2024). Functional connectivity development along the sensorimotor-association axis enhances the cortical hierarchy. *Nature Communications*, 15(1), 3511.
5. Poldrack, R. A., Markiewicz, C. J., Appelhoff, S., Ashar, Y. K., Auer, T., Baillet, S., Bansal, S., Beltrachini, L., Benar, C. G., Bertazzoli, G., Bhogawar, S., Blair, R. W., Bortoletto, M., Boudreau, M., Brooks, T. L., Calhoun, V. D., Castelli, F. M., Clement, P., Cohen, A. L., ... Gorgolewski, K. J. (2024). The past, present, and future of the brain imaging data structure (BIDS). *Imaging Neuroscience*, 2, 1–19.
6. Tobe, R. H., Tu, L., Roberts, M., Kiar, G., Breland, M. M., Tian, Y., Kang, M., Ross, R., Ryan, M. M., Valenza, E., Alexander, L., MacKay-Brandt, A., Colcombe, S. J., Franco, A. R., & Milham, M. P. (2024). Age, Motion, Medical, and Psychiatric Associations With Incidental Findings in Brain MRI. *JAMA Network Open*, 7(2), e2355901.
7. Gonzalez Pepe, I., Chatelain, Y., Kiar, G., & Glatard, T. (2024). Numerical stability of DeepGOPlus inference. *PloS One*, 19(1), e0296725.
8. Zhao, C., Jarecka, D., Covitz, S., Chen, Y., Eickhoff, S. B., Fair, D. A., Franco, A. R., Halchenko, Y. O., Hendrickson, T. J., Hoffstaedter, F., Houghton, A., Kiar, G., Macdonald, A., Mehta, K., Milham, M. P., Salo,

- T., Hanke, M., Ghosh, S. S., Cieslak, M., & Satterthwaite, T. D. (2024). A reproducible and generalizable software workflow for analysis of large-scale neuroimaging data collections using BIDS Apps. *Imaging Neuroscience*, 2, 1–19.
9. Amunts, K., Axer, M., Banerjee, S., Bitsch, L., Bjaalie, J. G., Brauner, P., Brovelli, A., Calarco, N., Carrere, M., Caspers, S., Charvet, C. J., Cichon, S., Cools, R., Costantini, I., D'Angelo, E. U., De Bonis, G., Deco, G., DeFelipe, J., Destexhe, A., ... Zaborszky, L. (2024). The coming decade of digital brain research: A vision for neuroscience at the intersection of technology and computing. *Imaging Neuroscience*, 2, 1–35.
 10. Kiar, G., Clucas, J., Feczko, E., Goncalves, M., Jarecka, D., Markiewicz, C. J., Halchenko, Y. O., Hermosillo, R., Li, X., Miranda-Dominguez, O., Ghosh, S., Poldrack, R. A., Satterthwaite, T. D., Milham, M. P., & Fair, D. (2023). Align with the NMIND consortium for better neuroimaging. *Nature Human Behaviour*, 7(7), 1027–1028.
 11. Xu, T., Kiar, G., Cho, J. W., Bridgeford, E. W., Nikolaidis, A., Vogelstein, J. T., & Milham, M. P. (2023). ReX: an integrative tool for quantifying and optimizing measurement reliability for the study of individual differences. *Nature Methods*, 20(7), 1025–1028.
 12. Poline, J.-B., Das, S., Glatard, T., Madjar, C., Dickie, E. W., Lecours, X., Beaudry, T., Beck, N., Behan, B., Brown, S. T., Bujold, D., Beauvais, M., Caron, B., Czech, C., Dharsee, M., Dugré, M., Evans, K., Gee, T., Ippoliti, G., ... Evans, A. C. (2023). Data and Tools Integration in the Canadian Open Neuroscience Platform. *Scientific Data*, 10(1), 189.
 13. Nikolaidis, A., Manchini, M., Auer, T., Bottenhorn, K. L., Alonso-Ortiz, E., González-Escamilla, G., Valk, S., Glatard, T., Atay, M. S., Bayer, J. M. M., Bijsterbosch, J., Algermissen, J., Beck, N., Bermudez, P., Bilgin, I. P., Bollmann, S., Bradley, C., Campbell, M. E. J., Caron, B., ... Zwiers, M. P. (2023). Proceedings of the OHBM Brainhack 2021. *Aperture Neuro*, 3, 1–20.
 14. Richie-Halford, A., Cieslak, M., Ai, L., Caffarra, S., Covitz, S., Franco, A. R., Karipidis, I. I., Kruper, J., Milham, M., Avelar-Pereira, B., Roy, E., Sydnor, V. J., Yeatman, J. D., Fibr Community Science Consortium, Satterthwaite, T. D., & Rokem, A. (2023). Author Correction: An analysis-ready and quality controlled resource for pediatric brain white-matter research. *Scientific Data*, 10(1), 247.
 15. Chatelain, Y., Young, N. Y. S., Kiar, G., & Glatard, T. (2023). PyTracer: Automatically Profiling Numerical Instabilities in Python. *IEEE Transactions on Computers. Institute of Electrical and Electronics Engineers*, 72(6), 1792–1803.
 16. PRIMatE Data and Resource Exchange (PRIME-DRE) Global Collaboration Workshop and Consortium. (2022). Toward next-generation primate neuroscience: A collaboration-based strategic plan for integrative neuroimaging. *Neuron*, 110(1), 16–20.
 17. Kruper, J., Yeatman, J. D., Richie-Halford, A., Bloom, D., Grotheer, M., Caffarra, S., Kiar, G., Karipidis, I. I., Roy, E., Chandio, B. Q., Garyfallidis, E., & Rokem, A. (2021). Evaluating the Reliability of Human Brain White Matter Tractometry. *Aperture Neuro*, 1(1).
<https://doi.org/10.52294/e6198273-b8e3-4b63-babb-6e6b0da10669>
 18. Kiar, G., Chatelain, Y., Salari, A., Evans, A. C., & Glatard, T. (2021). Data augmentation through Monte Carlo Arithmetic leads to more generalizable classification in connectomics. *Neurons, Behavior, Data Analysis, and Theory*, 1. <https://doi.org/10.51628/001c.28328>

19. **Kiar, G.**, Chatelain, Y., de Oliveira Castro, P., Petit, E., Rokem, A., Varoquaux, G., Misic, B., Evans, A. C., & Glatard, T. (2021). Numerical uncertainty in analytical pipelines lead to impactful variability in brain networks. *PLoS One*, 16(11), e0250755.<https://doi.org/10.1101/2020.10.15.341495>
20. Bridgeford, E. W., Wang, S., Wang, Z., Xu, T., Craddock, C., Dey, J., **Kiar, G.**, Gray-Roncal, W., Colantuoni, C., Douville, C., Noble, S., Priebe, C. E., Caffo, B., Milham, M., Zuo, X.-N., Consortium for Reliability and Reproducibility, & Vogelstein, J. T. (2021). Eliminating accidental deviations to minimize generalization error and maximize replicability: Applications in connectomics and genomics. *PLoS Computational Biology*, 17(9), e1009279.
21. Levitis, E., van Praag, C. D. G., Gau, R., Heunis, S., DuPre, E., **Kiar, G.**, Bottenhorn, K. L., Glatard, T., Nikolaidis, A., Whitaker, K. J., & Others. (2021). Centering inclusivity in the design of online conferences—An OHBM--Open Science perspective. *GigaScience*, 10(8), giab051.
22. Gau, R., Noble, S., Heuer, K., Bottenhorn, K. L., Bilgin, I. P., Yang, Y.-F., Huntenburg, J. M., Bayer, J. M. M., Bethlehem, R. A. I., Rhoads, S. A., Vogelbacher, C., Borghesani, V., Levitis, E., Wang, H.-T., Van Den Bossche, S., Kobeleva, X., Legarreta, J. H., Guay, S., Atay, S. M., ... Brainhack Community. (2021). Brainhack: Developing a culture of open, inclusive, community-driven neuroscience. *Neuron*, 109(11), 1769–1775.
23. **Kiar, G.**, de Oliveira Castro, P., Rioux, P., Petit, E., Brown, S. T., Evans, A. C., & Glatard, T. (2020). Comparing perturbation models for evaluating stability of neuroimaging pipelines. *The International Journal of High Performance Computing Applications*, 34(5), 491–501.
24. Bosch-Bayard, J., Aubert-Vazquez, E., Brown, S. T., Rogers, C., **Kiar, G.**, Glatard, T., Scaria, L., Galan-Garcia, L., Bringas-Vega, M. L., Virues-Alba, T., Taheri, A., Das, S., Madjar, C., Mohaddes, Z., MacIntyre, L., CHBMP, Evans, A. C., & Valdes-Sosa, P. A. (2020). A Quantitative EEG Toolbox for the MNI Neuroinformatics Ecosystem: Normative SPM of EEG Source Spectra. *Frontiers in Neuroinformatics*, 14, 33.
25. Salari, A., **Kiar, G.**, Lewis, L., Evans, A. C., & Glatard, T. (2020). File-based localization of numerical perturbations in data analysis pipelines. *GigaScience*, 9(12), giaa106.
26. Khundrakpam, B., Vainik, U., Gong, J., Al-Sharif, N., Bhutani, N., **Kiar, G.**, Zeighami, Y., Kirschner, M., Luo, C., Dagher, A., & Evans, A. (2020). Neural correlates of polygenic risk score for autism spectrum disorders in general population. *Brain Communications*, 2(2), fcaa092.
27. Zhang, M., Desrosiers, C., Guo, Y., Khundrakpam, B., Al-Sharif, N., **Kiar, G.**, Valdes-Sosa, P., Poline, J.-B., & Evans, A. (2020). Brain status modeling with non-negative projective dictionary learning. *NeuroImage*, 206, 116226.<https://doi.org/10.1016/j.neuroimage.2019.116226>
28. Yarkoni, T., Markiewicz, C. J., de la Vega, A., Gorgolewski, K. J., Salo, T., Halchenko, Y. O., McNamara, Q., DeStasio, K., Poline, J.-B., Petrov, D., Hayot-Sasson, V., Nielson, D. M., Carlin, J., **Kiar, G.**, Whitaker, K., DuPre, E., Wagner, A., Tirrell, L. S., Jas, M., ... Blair, R. (2019). PyBIDS: Python tools for BIDS datasets. *Journal of Open Source Software*, 4(40), 1294.<https://doi.org/10.21105/joss.01294>
29. **Kiar, G.**, Brown, S. T., Glatard, T., & Evans, A. C. (2019). A Serverless Tool for Platform Agnostic Computational Experiment Management. *Frontiers in Neuroinformatics*, 13, 12.

30. Matelsky, J., **Kiar, G.**, Johnson, E., Rivera, C., Toma, M., & Gray-Roncal, W. (2018). Container-Based Clinical Solutions for Portable and Reproducible Image Analysis. *Journal of Digital Imaging*, 31(3), 315–320.
31. Glatard, T., **Kiar, G.**, Aumentado-Armstrong, T., Beck, N., Bellec, P., Bernard, R., Bonnet, A., Brown, S. T., Camarasu-Pop, S., Cervenansky, F., Das, S., Ferreira da Silva, R., Flandin, G., Girard, P., Gorgolewski, K. J., Guttmann, C. R. G., Hayot-Sasson, V., Quirion, P.-O., Rioux, P., ... Evans, A. C. (2018). Boutiques: a flexible framework to integrate command-line applications in computing platforms. *GigaScience*, 7(5). <https://doi.org/10.1093/gigascience/giy016>
32. Gorgolewski, K. J., Alfaro-Almagro, F., Auer, T., Bellec, P., Capotă, M., Chakravarty, M. M., Churchill, N. W., Cohen, A. L., Craddock, R. C., Devenyi, G. A., Eklund, A., Esteban, O., Flandin, G., Ghosh, S. S., Guntupalli, J. S., Jenkinson, M., Keshavan, A., **Kiar, G.**, Liem, F., ... Poldrack, R. A. (2017). BIDS apps: Improving ease of use, accessibility, and reproducibility of neuroimaging data analysis methods. *PLoS Computational Biology*, 13(3), e1005209.
33. **Kiar, G.**, Gorgolewski, K. J., Kleissas, D., Roncal, W. G., Litt, B., Wandell, B., Poldrack, R. A., Wiener, M., Vogelstein, R. J., Burns, R., & Vogelstein, J. T. (2017). Science in the cloud (SIC): A use case in MRI connectomics. *GigaScience*, 6(5), 1–10.
34. Neuro Cloud Consortium. (2016). To the Cloud! A Grassroots Proposal to Accelerate Brain Science Discovery. *Neuron*, 92(3), 622–627.

proceedings in international peer-reviewed conferences

1. Li, X., Fedorov, A., Mathur, M., Abrol, A., **Kiar, G.**, Plis, S., & Calhoun, V. (2022). Pipeline-Invariant Representation Learning for Neuroimaging. *DMLR Workshop: Data-Centric Machine Learning Research*, abs/2208.12909. <https://doi.org/10.48550/arXiv.2208.12909>
2. Vicuna, M., Khannouz, M., **Kiar, G.**, Chatelain, Y., & Glatard, T. (2021). Reducing numerical precision preserves classification accuracy in Mondrian Forests. *IEEE International Conference on Big Data*, 2785–2790.
3. Salari, A., Chatelain, Y., **Kiar, G.**, & Glatard, T. (2021). Accurate Simulation of Operating System Updates in Neuroimaging Using Monte-Carlo Arithmetic. *Uncertainty for Safe Utilization of Machine Learning in Medical Imaging, and Perinatal Imaging, Placental and Preterm Image Analysis*, 14–23.
4. Mazaheri, M., **Kiar, G.**, & Glatard, T. (2021). A Recommender System for Scientific Datasets and Analysis Pipelines. *16th Workshop on Workflows in Support of Large-Scale Science, Super Computing*.
5. Rioux, P., **Kiar, G.**, Hutton, A., Evans, A. C., & Brown, S. T. (2020). Deploying Large Fixed File Datasets with SquashFS and Singularity. *Practice and Experience in Advanced Research Computing (PEARC)*, 72–76.
6. DuPre*, E., Kiar*, G., Craddock, R. C., Gorgolewski, K. J., Hoffstaedter, F., Keshavan, A., Poline, J. B., Visconti di Oleggio Castello, M., Whitaker, K., & Bellec, P. (2018, January). Organization for Human Brain Mapping Open Science Hackathons: Accessible and Inclusive Neuroinformatics. *2nd Workshop on Hacking and Making at Time-Bound Events*.
7. **Kiar, G.**, Mamatjan, Y., Jun, J., Maler, L., & Adler, A. (2013). Electric localization of weakly electric fish using neural networks. *Journal of Physics: Conference Series*, 434.

book chapters

1. Park, S., Thomson, P., **Kiar, G.**, Castellanos, F. X., Milham, M. P., Bernhardt, B., & Di Martino, A. (2024). Delineating a pathway for the discovery of functional connectome biomarkers of autism. In *Neurophysiological and Neuroimaging Biomarkers in Neuropsychiatry – Etiological and Treatment Implications*. Springer Nature.
2. **Kiar, G.**, Makowski, C., Poline, J. B., Das, S., & Evans, A. C. (2017). The Montreal Neurological Institute Ecosystem: Enabling Reproducible Neuroscience from Collection to Analysis in the Web. In *Neuroinformatics in the Age of Big Data: Working with the Right Data and Tools* (pp. 51–56). Society for Neuroscience.

invited talks & organized workshops

1. Improving the robustness of neuroimaging through exploitation of variability in processing pipelines. *BRAIN Initiative Investigators Meeting — National Institutes of Health (November 2024)*, Presenter.
2. Bridging the gap between neuroimaging and the broader data science ecosystem. *The International Neuroinformatics Coordinating Facility (September 2024)*, Presenter.
3. Improving the robustness of neuroimaging through exploitation of variability in processing pipelines. *BRAIN Initiative Investigators Meeting — National Institutes of Health (October 2023)*, Presenter.
4. NMIND: Align, Test, Engage. *Helmholz International BigBrain Analytics and Learning Laboratory Summit (October, 2023)*, Presenter & Panelist.
5. NMIND: Align, Test, Engage. *Organization for Human Brain Mapping (June 2023)*, Presenter.
6. UNIQUE Student Symposium for Neuro-AI. *UNIQUE MILA (June 2023)*, Panelist.
7. Variation in Brain Imaging – when is it meaningful? (and what can we do about it). *The Center for Biomedical Imaging and Neuromodulation, Nathan Kline Institute (August 2022)*, Presenter.
8. Fuzzy environments for the perturbation evaluation and application of uncertainty quantification. *Chinese Open Science Network (July 2022)*, Presenter.
9. Variation in Brain Imaging - when is it meaningful? (and what do we do about it). *Center for Neurodevelopmental and Imaging Research, Kennedy Krieger Institute (April 2022)*, Presenter.
10. Fuzzy Environments for the perturbation, evaluation, and application of uncertainty quantification via Monte Carlo Arithmetic. *Scipy Conference (July 2021)*, Presenter.
11. Evaluating the Stability of Neuroimaging Pipelines. *National Institute of Mental Health (February 2020)*, Presenter.
12. Comparing Perturbation Models for Evaluating Stability of Neuroimaging Pipelines. *Computational Reproducibility at Exascale — Super Computing Conference (November 2019)*, Presenter.
13. From “Open Science” to “Science”: Shifting the status quo in data sharing, software, and publishing. *Organization for Human Brain Mapping (June 2019)*, Symposium organizer & Presenter.
14. Introduction to Scientific Software Development and Machine Learning. *Healthy Brains for Healthy Lives — McGill University (February 2019)*, Workshop organizer & Presenter.
15. A FAIR Approach to Neuroimaging Analysis with Boutiques. *Organization for Human Brain Mapping (June 2018)*, Presenter.

16. Connectome Coding: what is it, how do we do it, and why do we care? *Data science in Neuroscience Symposium — Organization for Human Brain Mapping (June 2018)*, Presenter.
17. OHBM Annual BrainHack & TrainTrack. *Open Science Special Interest Group — Organization for Human Brain Mapping (June 2018)*, Workshop organizer & Presenter.
18. Brainhack Global: Montreal Edition. *McGill University & Universite de Montreal (June 2018)*, Workshop organizer.
19. A Data Driven Approach for Tackling Big Data Connectomics. *Feindel Brain Imaging Lecture — McGill University (February 2018)*, Presenter.
20. Coding for Neuroscientists: An Introduction to Neuroscience Informatics. *Graduate Student Association for Neuroscience — McGill University (January 2018)*, Workshop organizer & Presenter.
21. BigNeuro 2017: Analyzing brain data from nano to macroscale. *Neural Information Processing Systems (Dec. 2017)*, Workshop organizer.
22. Enabling Accessible and Scalable Neuroscience. *Healthy Brains For Healthy Lives — McGill University (November 2017)*, Presenter.
23. Platforms for high performance computing in neuroscience. *Neuroinformatics in the Age of Big Data: Working with the Right Data and Tools — Society for Neuroscience (November 2017)*, Workshop organizer & Presenter.
24. Brainhack101 & Exploratory Data Analysis. *Online Intensive for Brain Science: Computation and Imaging — National Institute of Health (September 2017)*, Presenter.
25. CloudControl: Integrating Quality Control and Pipeline Deployment in the Cloud. *Open Science Special Interest Group — Organization for Human Brain Mapping (June 2017)*, Presenter.
26. Open Science Session Chair. *Open Science Special Interest Group — Organization for Human Brain Mapping (June 2017)*, Workshop organizer & Presenter.
27. Science in the Cloud (SIC): A use-case in MRI Connectomics. *Open Science Special Interest Group — Organization for Human Brain Mapping (June 2017)*, Presenter.
28. Brain Hacking 101. *Open Science Special Interest Group — Organization for Human Brain Mapping (June 2017)*, Presenter.
29. NeuroStorm: Accelerating Brain Science Discovery in the Cloud. *Johns Hopkins University & National Science Foundation (June 2017)*, Workshop organizer.

posters at international peer-reviewed conferences

1. Rupprecht, F., Lane, C., Vos de Wael, R., Milham, M. P., & Kiar, G. (2024). Rethinking How We Wrap Command Line Tools from Python. *Organization for Human Brain Mapping*.
2. Lane, C., Rupprecht, F., Milham, M. P., & Kiar, G. (2024). Benchmarking 200+ pairwise similarity measures for resting-state functional connectivity estimation. *Organization for Human Brain Mapping*.
3. Kenneally, E., Giavasis, S., Clucas, J., Milham, M. P., & Kiar, G. (2024). How C-PAC NodeBlocks and resource pool enable modular testing and cross-pipeline compatibility. *Organization for Human Brain Mapping*.

4. Ghanem, J., Totzek, J., Henri-Bellemare, C., Draper, E., Raucher-Ch  n  , D., **Kiar, G.**, Patel, R., Chakravarty, M., Shah, J., Joobar, R., Malla, A., Lepage, M., & Lavigne, K. (2024). White Matter Integrity and Verbal Memory After a First Episode of Psychosis: A Longitudinal Study. *Organization for Human Brain Mapping*.
5. Luo, A., Sydnor, V., Pines, A., Larsen, B., Alexander-Bloch, A. F., Cieslak, M., ..., **Kiar, G.**, ..., Milham, M. P., & Satterthwaite, T. D. (2023). Refinement of Functional Connectivity in Development Aligns with the Sensorimotor-Association Axis. *Organization for Human Brain Mapping*.
6. **Kiar, G.**, Clucas, J., Feczko, E., Goncalves, M., Jarecka, D., Markiewicz, C. J., ..., Milham, M. P., & Fair, D. (2023). NMIND: A Grassroots Collaborative to Elevate Neuroimaging Software. *Organization for Human Brain Mapping*.
7. Bianchini-Esper, N., Covitz, S., Castro, A., ..., **Kiar, G.**, Milham, M. P., Satterthwaite, T., & Franco, A. (2023). A protocol for visual quality control applied to the Reproducible Brain Chart database. *Organization for Human Brain Mapping*.
8. Li, X., Federox, A., Mathur, M., Abrol, A., **Kiar, G.**, Pils, S., & Calhoun, V. (2023). Pipeline-Invariant Representation Learning for Neuroimaging. *Organization for Human Brain Mapping*.
9. Bridgeford, E. W., Powell, M., **Kiar, G.**, Noble, S., ..., & Vogelstein, J. T. (2023). Causal Reasoning is Critical to Understanding Batch Effects. *Organization for Human Brain Mapping*.
10. **Kiar, G.**, Bridgeford, E. W., Clucas, J., Bianchini-Esper, N., Lane, C., Rupprecht, F., Xu, T., & Milham, M. P. (2023). Variations in variability: a word of caution for those navigating the multiverse of methods. *Organization for Human Brain Mapping*.
11. Rupprecht, F., Gutierrez, A., Clucas, J., Giavasis, S., Milham, M. P., & **Kiar, G.** (2023). Developer tools for neuroimaging workflow creation and pre-deployment. *Organization for Human Brain Mapping*.
12. Lane, C., Clucas, J., Bianchini-Esper, N., Xu, T., Milham, M. P., & **Kiar, G.** (2023). Connecting neuroimaging to the broader data science ecosystem. *Organization for Human Brain Mapping*.
13. Clucas, J., Giavasis, S., **Kiar, G.**, & Milham, M. P. (2023). NodeBlocks: Lowering the Barriers to Building into C-PAC. *Organization for Human Brain Mapping*.
14. Li, X., Ai, L., Giavasis, S., Jin, H., Feczko, E., ..., **Kiar, G.**, & Milham, M. P. (2022). Moving Beyond Processing and Analysis-Related Variation in Neuroscience. *Organization for Human Brain Mapping*.
15. Bridgeford, E. W., Powell, M., **Kiar, G.**, Lawrence, R., Xu, T., Caffo, B., Milham, M. P., & Vogelstein, J. T. (2022). Batch Effects are Causal Effects: Applications in Human Connectomics. *Organization for Human Brain Mapping*.
16. Xu, T., **Kiar, G.**, Cho, J. W., Bridgeford, E. W., Vogelstein, J. T., & Milham, M. P. (2022). Shiny Reliability Explorer (ReX): Quantifying and Optimizing Reliability for the Study of Individual Differences. *Organization for Human Brain Mapping*.
17. **Kiar, G.**, Mumford, J., Xu, T., Vogelstein, J. T., Glatard, T., & Milham, M. P. (2022). A hitchhiker's guide (or checklist) to capturing neuroimaging variability. *Organization for Human Brain Mapping*.
18. Chatelain, Y., Tetrel, L., Markiewicz, C. J., **Kiar, G.**, Esteban, O., Bellec, P., & Glatard, T. (2022). Testing the long-term reproducibility of fMRIPrep results. *Organization for Human Brain Mapping*.
19. **Kiar, G.**, Chatelain, Y., Salari, A., ..., Evans, A. C., & Glatard, T. (2021). Leveraging Numerical Instabilities In Connectome Estimation For More Generalizable Models. *Organization for Human Brain Mapping*.

20. Richie-Halford, A., Bloom, D., ..., **Kiar, G.**, ..., & Rokem, A. (2021). Evaluating the reliability of diffusion-MRI based tractometry. *Organization for Human Brain Mapping*.
21. Levitis, E., Vogel, J., **Kiar, G.**, Funck, T., Ituria, Y., & Evans, A. C. (2020). Validation of an epidemic spreading model to simulate A β spread in familial Alzheimer's disease. *Organization for Human Brain Mapping*.
22. Henri-Bellemare, C., **Kiar, G.**, Lavigne, K., Patel, R., Chakravarty, M. M., & Lepage, M. (2020). Exploring the Relationship Between Early Psychosis Verbal Memory Deficits and White Matter Integrity. *Organization for Human Brain Mapping*.
23. Chung, J., Dey, J., **Kiar, G.**, Priebe, C. E., & Vogelstein, J. T. (2020). Human Structural Connectomes are Heritable. *Organization for Human Brain Mapping*.
24. Bosch-Bayard, J., Rogers, C., Aubert, E., Brown, S. T., **Kiar, G.**, Glatard, T., Galán-García, L., Bringas Vega, T., M. Virues, Das, S., Madjar, C., Mohades, Z., MacIntyre, L., Evans, A. C., & Valdes-Sosa, P. (2020). Incorporating quantitative EEG analysis into the MNI Open Science neuroinformatics ecosystem. *Organization for Human Brain Mapping*.
25. **Kiar, G.**, Salari, A., Hannema, R., Vadariya, M., Dugre, M., Rioux, P., Douglas, P., Brown, S. T., de Oliveira Castro, P., Petit, E., Evans, A. C., & Glatard, T. (2020). Fuzzy: An Ecosystem for Evaluating the Stability of Pipelines Through Monte Carlo Arithmetic. *Organization for Human Brain Mapping*.
26. Bridgeford, E., Wang, S., Yang, Z., Wang, Z., Xu, T., Craddock, C., Dey, J., **Kiar, G.**, Gray-Roncal, W. R., Priebe, C. E., Caffo, B., Milham, M., Zuo, X. N., & Vogelstein, J. T. (2020). Optimal Experimental Design for Big Data: Applications in Brain Imaging. *Organization for Human Brain Mapping*.
27. Beck, N., Rioux, P., **Kiar, G.**, Brown, S. T., Czech, C., Boroday, S., Lecours-Boucher, X., Quesnel, D., Rogers, C., Khalili-Mahani, N., Adalat, R., Glatard, T., Das, S., & Evans, A. C. (2020). New Open Science features in the CBRAIN Platform. *Organization for Human Brain Mapping*.
28. Dockès, J., Chawla, K., Abraham, A., Bazeille, T., Boos, M., Bougacha, S., Bzdok, D., Chevalier, J. A., Dadi, K., de Hollander, G., Delettre, C., DuPre, E., Gale, D., Gorgolewski, K., Gramfort, A., Grigis, A., Guidotti, R., Hammonds, R., Hoyos-Idrobo, A., ... Varoquaux, G. (2020). Nilearn and Nistats: Machine learning and statistics for fMRI in Python. *Organization for Human Brain Mapping*.
29. **Kiar, G.**, Benderoff, E., Charrière, J., Dubé, S., Guérin, L. O., Bonnet, A., Camarasu-Pop, S., Beck, N., Rioux, P., Boroday, S., Brown, S. T., Poline, J. B., Evans, A. E., & Glatard, T. (2019). A FAIR Approach to Neuroimaging Analysis with Boutiques. *Organization for Human Brain Mapping*.
30. Brown, S. T., Rioux, P., Beck, N., Khalili-Mahani, N., Czech, C., Taheri, A., Boroday, S., **Kiar, G.**, Lecours-Boucher, X., Makowski, C., Quesnel, D., Poline, J. B., Adalat, R., Glatard, T., & Evans, A. C. (2019). Advancements in the CBRAIN Platform through the Integration of Community-Based Tools and Standards. *Organization for Human Brain Mapping*.
31. Suarez, L. E., **Kiar, G.**, Doyle, R. A., Evans, A. C., & Misic, B. (2018, September). Reverse Engineering the Human Connectome: Learning Function from Structure. *Resting State Brain Connectivity*.
32. Salari, A., Scaria, L., **Kiar, G.**, & Glatard, T. (2018). Numerical error propagation in the HCP structural pre-processing pipelines. *Organization for Human Brain Mapping*.
33. **Kiar, G.**, Glatard, T., & Poline, J. B. (2018). An Extensible Application Programming Interface for Querying Distributed Neuroscience Datasets. *Organization for Human Brain Mapping*.

34. Yarkoni, T., de la Vega, A., DuPre, E., Esteban, O., Halchenko, Y., Hanke, M., Hayot-Sasson, V., Ivanov, A., **Kiar, G.**, Markiewicz, C., McNamara, Q., Petrov, D., Poline, J. B., Poldrack, R., & Gorgolewski, K. J. (2018). Pybids: Python tools for manipulation and analysis of BIDS datasets. *Organization for Human Brain Mapping*.
35. Doyle, A., **Kiar, G.**, Toussaint, P., Lemaitre, P., & Evans, A. C. (2018). Creativity is Unrelated to Intelligence and Personality: A Machine Learning Study. *Organization for Human Brain Mapping*.
36. Taheri, A., Lurie, J., Abou-Haidar, R., Brown, S. T., Das, S., Doyle, A., Khalili-Mahani, N., **Kiar, G.**, Kostopoulos, P., Lepage, C., Lewis, L., Makowski, C., Rogers, C., Toussaint, P., & Evans, A. C. (2018). PIVT: A Platform Independent Visualization Tool. *Organization for Human Brain Mapping*.
37. **Kiar, G.**, Glatard, T., Brown, S. T., & Evans, A. C. (2018). Clowdr: a micro-service model for scalable, reproducible, and accessible neuroinformatics. *Organization for Human Brain Mapping*.
38. Vogel, J., Ossenkoppele, R., **Kiar, G.**, Hansson, O., & Evans, A. C. (2018). Heterogeneous tau-PET signal in the hippocampus resolves discrepancies between imaging and pathology. *Organization for Human Brain Mapping*.
39. Bridgeford, E., **Kiar, G.**, Chandrashekhar, V., Shen, C., Gray Roncal W. R. Priebe, C. E., Caffo, B., & Vogelstein, J. (2018). A Principled Approach to Statistical Connectomics and Mega-Analysis. *Organization for Human Brain Mapping*.
40. Al-Sharif, N., **Kiar, G.**, Khundrakpam, B., & Evans, A. C. (2018). Exploring whole-brain structural connectivity and cognitive performance in typical development. *Organization for Human Brain Mapping*.
41. Gorgolewski, K. J., Alfaro-Almagro, F., Auer, T., Bellec, P., Capotă, M., Chakravarty, M. M., Churchill, N. W., Cohen, A. L., Craddock, R. C., Devenyi, G. A., Eklund, A., Esteban, O., Flandin, G., Guntupalli, J. S., Jenkinson, M., Keshavan, A., **Kiar, G.**, Raamana, P. R., Raffelt, D., ... Poldrack, R. A. (2017). BIDS apps: Improving ease of use, accessibility, and reproducibility of neuroimaging data analysis methods. *Organization for Human Brain Mapping*.
42. **Kiar, G.**, Gray Roncal, W. R., Mhembe, D., Bridgeford, E. W., Wang, S., Priebe, C. E., Burns, R., & Vogelstein, J. T. (2016). MR Graph with Rich attribUTES DataBase (Mr. GruteDB). *Organization for Human Brain Mapping*.
43. Vogelstein, J. T., & et al. (2015). The Open Connectome Project & NeuroData: Enabling Data Driven Neuroscience at Scale. *Society for Neuroscience*.
44. **Kiar, G.**, Gray Roncal, W. R., Mhembe, D., Bridgeford, E. W., Clark, D., Milham, M. P., Craddock, R. C., Burns, R., & Vogelstein, J. T. (2015). Community Connectomics via Cloud Computing Utilizing m2g: a Reference Pipeline. *Organization for Human Brain Mapping*.

published code

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