Christopher J Markiewicz

Stanford University
Department of Psychology, Building 420
450 Jane Stanford Way, Stanford, CA 94305
✉ markiewicz@stanford.edu

Education

2017 — **PhD. Cognitive and Neural Systems**, *Boston University*, Boston, MA
Dissertation: Multivariate pattern analysis of input and output representations of speech
Advisor: Jason W. Bohland

2009 — **BS. Mathematics**, *University of Tulsa*, Tulsa, OK

2009 — **BCS. Computer Science**, *University of Tulsa*, Tulsa, OK

Experience

2017 – **Software Developer**, *Stanford University*, Stanford, CA
Center for Reproducible Neuroscience
- fMRIPrep - developer
- FitLins - lead developer
- OpenNeuro - technical lead
- Brain Imaging Data Structure (BIDS) - maintainer, extension lead

2009 – 2010 **Bioinformatics programmer**, *University of Tulsa*, Tulsa, OK
InSilico Research Group: PySNPRank, PyGAIN, Bioinformatics format converters

2009 – 2010 **Neuroinformatics intern**, *Laureate Institute for Brain Research*, Tulsa, OK
XNAT deployment, HIPAA compliance, Asset tracker

Teaching

2019 – **Instructor**, *Martinos Center for Biomedical Imaging - Functional MRI Workshop*, Boston, MA
Lectures: "fMRIPrep: A Robust Preprocessing Pipeline for fMRI Data"
"BIDS: Brain Imaging Data Structure; Quality Assurance Issues"

2022 **Instructor**, *Practice and Theory of Brain Imaging*, Online course

2020 **Instructor**, *Neuro Data Science*, Montreal, QC

2020 **Instructor**, *Neurohackademy*, Online

2019 **Instructor**, *Neurohackademy*, Seattle, WA

2019 **Instructor**, *Coastal Coding Workshop*, Miami, FL

2017 **Instructor**, *Hands-on Reproducible and Scalable Brain Imaging Analysis with Nipype*, Cambridge, MA

Research funding

Active

2021 – 2023 **Co-Investigator**, *Strengthening Community and Code Foundations for Brain Imaging*, CZI Essential Open Source Software

Professional societies

Organization for Human Brain Mapping

Open source development*

2019 – **Maintainer**, *PyBIDS*, bids-standard.github.io/pybids
Python tools for querying and manipulating BIDS datasets

2018 – **Maintainer**, *Pydra*, nipype.github.io/pydra
Dataflow engine that forms the core of the Nipype 2 ecosystem

2017 – **Author**, *FitLins*, fitlins.readthedocs.io
Application for fitting linear models to BIDS datasets

2017 – **Maintainer**, *fMRIPrep*, fmriprep.org
A Robust Preprocessing Pipeline for fMRI Data

2017 – **Lead maintainer**, *NiBabel*, nipy.org/nibabel
Python library for reading/writing a variety of neuroimaging formats

2017 – **Maintainer**, *NiPype*, nipype.readthedocs.io
Python library for building and executing neuroimaging workflows

2020 – 2023 **Maintainer**, *Versioneer*, github.com/python-versioneer/python-versioneer
Python tool for integrating version control information in package metadata

Service/Leadership

2019 – **Maintainer**, *The Brain Imaging Data Structure (BIDS)*

2022 **Co-moderator**, *Open Science Room Panel - "Open Code: Myths Debunked"*, Glasgow, UK

2019 **Co-moderator**, *BIDS Computational Modeling Workshop*, Princeton, NJ

2017 **Co-organizer**, *BrainHack Global 2017*, Cambridge, MA

2015 **Co-organizer**, *7th Annual Inter-Science of Learning Conference*, La Jolla, CA

2013 **Co-organizer**, *5th Annual Inter-Science of Learning Conference*, Philadelphia, PA

Publications

Peer Reviewed Journals

Bourget MH, Kamentsky L, Ghosh SS, Mazzamuto G, Lazari A, **Markiewicz CJ**, et al. (April 2022). Microscopy-BIDS: An Extension to the Brain Imaging Data Structure for Microscopy Data. *Frontiers in Neuroscience*, 16. doi:10.3389/fnins.2022.871228.

Ciric R, Thompson WH, Lorenz R, Goncalves M, MacNicol EE, **Markiewicz CJ**, et al. (December 2022). TemplateFlow: FAIR-sharing of multi-scale, multi-species brain models. *Nature Methods*, 19:1568–1571. doi:10.1038/s41592-022-01681-2.

Clement P, Castellaro M, Okell TW, Thomas DL, Vandemaele P, Elgayar S, et al. (September 2022). ASL-BIDS, the brain imaging data structure extension for arterial spin labeling. *Scientific Data*, 9:543. doi:10.1038/s41597-022-01615-9.

de la Vega A, Rocca R, Blair RW, **Markiewicz CJ**, Mentch J, Kent JD, et al. (August 2022). Neuroscout, a unified platform for generalizable and reproducible fMRI research. *eLife*, 11. doi:10.7554/eLife.79277.

Karakuzu A, Appelhoff S, Auer T, Boudreau M, Feingold F, Khan A, et al. (2022). qMRI-BIDS: An extension to the brain imaging data structure for quantitative magnetic resonance imaging data. *Scientific Data*, 9. doi:10.1038/s41597-022-01571-4.

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*Associated publications and additional contributions in Software section

Niso G, Botvinik-Nezer R, Appelhoff S, Vega ADL, Esteban O, Etzel JA, et al. (November 2022). Open and reproducible neuroimaging: From study inception to publication. *NeuroImage*, 263:119,623. doi:10.1016/j.neuroimage.2022.119623.

Norgaard M, Matheson GJ, Hansen HD, Thomas A, Searle G, Rizzo G, et al. (March 2022). PET-BIDS, an extension to the brain imaging data structure for positron emission tomography. *Scientific Data*, 9:65. doi:10.1038/s41597-022-01164-1.

DuPre E, Salo T, Ahmed Z, Bandettini PA, Bottenhorn KL, Caballero-Gaudes C, et al. (2021). TE-dependent analysis of multi-echo fMRI with tedana. *Journal of Open Source Software*, 6(66):3669. doi:10.21105/joss.03669.

Gau R, Noble S, Heuer K, Bottenhorn KL, Bilgin IP, Yang YF, et al. (June 2021). Brainhack: Developing a culture of open, inclusive, community-driven neuroscience. *Neuron*, 109(11):1769–1775. doi:10.1016/j.neuron.2021.04.001.

Goncalves M, **Markiewicz CJ**, Moia S, Ghosh SS, Poldrack RA, and Esteban O (September 2021). NiTransforms: A Python tool to read, represent, manipulate, and apply n-dimensional spatial transforms. *Journal of Open Source Software*, 6(65):3459. doi:10.21105/joss.03459.

Halchenko YO, Meyer K, Poldrack B, Solanky DS, Wagner AS, Gors J, et al. (July 2021). DataLad: distributed system for joint management of code, data, and their relationship. *Journal of Open Source Software*, 6(63):3262. doi:10.21105/joss.03262.

Hanke M, Pestilli F, Wagner AS, **Markiewicz CJ**, Poline JB, and Halchenko YO (February 2021). In defense of decentralized research data management. *Neuroforum*, 27(1):17–25. doi:10.1515/nf-2020-0037.

Markiewicz CJ, Gorgolewski KJ, Feingold F, Blair R, Halchenko YO, Miller E, et al. (October 2021). The OpenNeuro resource for sharing of neuroscience data. *eLife*, 10:e71,774. doi:10.7554/eLife.71774.

Esteban O, Ciric R, Finc K, Blair RW, **Markiewicz CJ**, Moodie CA, et al. (July 2020). Analysis of task-based functional MRI data preprocessed with fMRIPrep. *Nature Protocols*, 15(7):2186–2202. doi:10.1038/s41596-020-0327-3.

Moreau CA, Jean-Louis M, Blair R, **Markiewicz CJ**, Turner JA, Calhoun VD, et al. (October 2020). The genetics-BIDS extension: Easing the search for genetic data associated with human brain imaging. *GigaScience*, 9(10):giaa104. doi:10.1093/gigascience/giaa104.

Poldrack R, Feingold F, Frank MJ, Gleeson P, de Hollander G, Huys QJ, et al. (December 2019). The importance of standards for sharing of computational models and data. *Computational Brain & Behavior*, 2(3-4):229. doi:10.1007/s42113-019-00062-x.

Yarkoni T, **Markiewicz CJ**, de la Vega A, Gorgolewski KJ, Salo T, Halchenko Y, et al. (August 2019). PyBIDS: Python tools for BIDS datasets. *Journal of Open Source Software*, 4(40):1294. doi:10.21105/joss.01294.

Esteban O, **Markiewicz CJ**, Blair RW, Moodie CA, Isik AI, Erramuzpe A, et al. (December 2018). fMRIPrep: a robust preprocessing pipeline for functional MRI. *Nature Methods*. doi:10.1038/s41592-018-0235-4.

Markiewicz CJ and Bohland JW (November 2016). Mapping the cortical representation of speech sounds in a syllable repetition task. *NeuroImage*, 141:174–190. doi:10.1016/j.neuroimage.2016.07.023.

Books and Book Chapters

Wagner AS, Waite LK, Meyer K, Heckner MK, Kadelka T, Reuter N, et al. (February 2023). *The DataLad Handbook*. Zenodo. doi:10.5281/zenodo.7640431.

Conference Proceedings

Esteban O, Goncalves M, **Markiewicz CJ**, Ghosh SS, and Poldrack RA (April 2020). Software Tool to Read, Represent, Manipulate, and Apply N-Dimensional Spatial Transforms. In *2020 IEEE 17th International Symposium on Biomedical Imaging (ISBI)*, pages 709–712. doi:10.1109/ISBI45749.2020.9098466.

Jarecka D, Goncalves M, **Markiewicz CJ**, Esteban O, Lo N, Kaczmarzyk J, and Ghosh S (2020). Pydra - a flexible and lightweight dataflow engine for scientific analyses. In Meghann Agarwal, Chris Calloway, Dillon Niederhut, and David Shupe, editors, *Proceedings of the 19th Python in Science Conference*, pages 132 − 139. doi:10.25080/Majora-342d178e-012.

Roberts W, **Johnson C**, and Hale J (2010). Transparent Emergency Data Destruction. In *The 5th International Conference on Information-Warfare & Security*, pages 271–278.

Louthan G, McMillan C, **Johnson C**, and Hale J (2009). Toward Robust and Extensible Automatic Protocol Identification. In *International Conference on Internet Computing*, pages 104–108.

Preprints

Provins C, **Markiewicz CJ**, Ciric R, Goncalves M, Caballero-Gaudes C, Poldrack R, et al. (January 2022). Quality control and nuisance regression of fMRI, looking out where signal should not be found. doi:10.31219/osf.io/hz52v.

Bansal S, Kori A, Zulfikar W, Wexler J, **Markiewicz CJ**, Feingold FF, et al. (April 2021). High-sensitivity detection of facial features on MRI brain scans with a convolutional network. Technical report. doi:10.1101/2021.04.25.441373.

Esteban O, Goncalves M, **Markiewicz CJ**, Ghosh SS, and Poldrack R (October 2019). Software tool to read, represent, manipulate, and apply n-dimensional spatial transforms. doi:10.31219/osf.io/8aq7b.

Presentations

Invited Talks

Markiewicz CJ. OpenNeuro: An open repository for neuroimaging data sharing. Brainhack, Glasgow, UK, June 2022. (Oral).

Markiewicz CJ. BIDS: The Brain Imaging Data Structure. Laboratory for NeuroImaging of Coma and Consciousness, Boston, MA (Online), January 2021. (Oral).

Markiewicz CJ. BIDS Applications and Derivatives. Open and Reproducible Neuroimaging, Oldenburg, Germany (Online), November 2020. (Oral).

Markiewicz CJ. The BIDS Ecosystem. Neuro Data Science, Montreal, QC, Canada (Online), May 2020. (Oral).

Markiewicz CJ. Testing Scientific Software. Nilearn Dev Days 2020, Online, May 2020. (Oral).

Markiewicz CJ, Appelhoff S, Calhoun V, Dickie EW, Duff E, DuPre E, et al. BIDS Derivatives – Standardizing processing results of neuroimaging data. LiveMEEG 2020, Online, October 2020. (Poster).

Markiewicz CJ, Appelhoff S, Calhoun V, Dickie EW, Duff E, DuPre E, et al. BIDS Derivatives – Standardizing processing results of neuroimaging data. Organization for Human Brain Mapping Annual Meeting, Online, June 2020. (Poster).

Markiewicz CJ. BIDS Apps Metadata. Making Open Neuroscience Infrastructure Interoperable (MONII 2.0) Workshop, Montreal, QC, Canada, March 2019. (Oral).

Markiewicz CJ. BIDS: The Brain Imaging Data Structure. Athinoula A. Martinos Center for Biomedical Imaging, Boston, MA, October 2019. (Oral).

Markiewicz CJ. FitLins - Reproducible model estimation for fMRI. Organization for Human Brain Mapping Annual Meeting, Rome, Italy, June 2019. (Software demonstration).

Markiewicz CJ. fMRIPrep - A Robust Preprocessing Pipeline for Functional MRI. Neurohackademy 2019, Seattle, WA, August 2019. (Oral).

Markiewicz CJ. fMRIPrep: A Robust fMRI Preprocessing Pipeline. Athinoula A. Martinos Center for Biomedical Imaging, Boston, MA, October 2019. (Oral).

Markiewicz CJ. niflows - Reuse, Create, and Package your own Workflows. Coastal Coding Workshop, Miami, FL, January 2019. (Oral).

Markiewicz CJ. FMRIprep: Building a Robust Preprocessing Pipeline for fMRI. Organization for Human Brain Mapping Annual Meeting, Singapore, June 2018. (Software demonstration).

Markiewicz CJ. Using Python for neuroimaging. Hands-on Reproducible and Scalable Brain Imaging Analysis with Nipype, Cambridge, MA, March 2017. (Oral).

Markiewicz CJ. Multivariate pattern analysis of input and output representations of speech. Boston Speech Motor Control Working Group, Boston, MA, December 2016. (Oral).

Johnson CJ and Bohland JW. Localizing categorical speech representations in perception and production. Society for Neuroscience, Washington, DC, November 2014. (Oral).

Johnson CJ. Localizing Neural Representations of Speech Sounds. Second CELEST Workshop on Adaptive Brain-Computer Interactions, Boston, MA, June 2013. (Oral).

Poster Presentations

Adon R, Appelhoff S, Auer T, Guillo L, Halchenko YO, Keator D, et al. BIDS-prov: a provenance framework for BIDS. Organization for Human Brain Mapping Annual Meeting, Seoul, South Korea (Online), June 2021. (Poster).

Esteban O, Adebimpe A, **Markiewicz CJ**, Goncalves M, Blair RW, Cieslak P Matthew, et al. The Bermuda Triangle of d- and f-MRI sailors - software for susceptibility distortions (SDCFlows). Organization for Human Brain Mapping Annual Meeting, Seoul, South Korea (Online), June 2021. (Poster).

Markiewicz CJ, Bottenhorn KL, Chen G, De la Vega A, Esteban O, Maumet C, et al. BIDS Statistical Models - An implementation-independent representation of General Linear Models. Organization for Human Brain Mapping Annual Meeting, Seoul, South Korea (Online), June 2021. (Poster).

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†Presenter, when not first author

Markiewicz CJ, de la Vega A, Yarkoni T, Poldrack RA, and Gorgolewski KJ. FitLins - Reproducible model estimation for fMRI. Organization for Human Brain Mapping Annual Meeting, Rome, Italy, June 2019. (Poster).

Markiewicz CJ, Esteban O, Blair RW, Ma F, Kent JD, Heinsfeld AS, et al. FMRIprep: Building a Robust Preprocessing Pipeline for fMRI. Organization for Human Brain Mapping Annual Meeting, Singapore, June 2018. (Poster).

Yarkoni T, de la Vega A, DuPre E, Esteban O, Halchenko Y, Hanke M, et al. Pybids: Python tools for manipulation and analysis of BIDS datasets. Organization for Human Brain Mapping Annual Meeting, Singapore, June 2018. (Poster).

Markiewicz CJ, Kroshian GS, You J, and †Bohland JW. Multivariate analysis of input and output representations in speech. Organization for Human Brain Mapping Annual Meeting, Geneva, June 2016. (Poster).

Markiewicz CJ and Bohland JW. Localizing categorical speech representations in perception and production. Neural Processing in Humans, Animals, and Man, Boston, MA, June 2015. (Poster).

Johnson CJ and Bohland JW. Localizing Speech Sound Representations in a Syllable Repetition Task. 6th Annual Inter-Science of Learning Conference, Pittsburgh, PA, February 2014. (Poster).

Johnson CJ and †Bohland JW. Mapping the cortical representation of speech sounds during syllable repetition. Society for the Neurobiology of Language Annual Meeting, Amsterdam, NL, August 2014. (Poster).

Johnson CJ, Mitra PP, and Bohland JW. The Online Brain Atlas Reconciliation Tool (OBART): A web application for MRI atlas exploration and multi-atlas labeling. Society for Neuroscience 2012 Annual Meeting, New Orleans, LA, October 2012. (Poster).

Johnson CJ and Yazdanbakhsh A. A minimal model of motion tuning in middle temporal visual cortex. 16th International Conference on Cognitive and Neural Systems, Boston, MA, May 2012. (Poster).

Software

Developed and Maintained Software

Brett M, **Markiewicz CJ**, Hanke M, Côté MA, Cipollini B, McCarthy P, et al. (April 2023). nipy/nibabel: 5.1.0. doi:10.5281/zenodo.7795644.

Esteban O, Baratz Z, **Markiewicz CJ**, MacNicol E, Provins C, and Hagen MP (March 2023). MRIQC: Advancing the automatic prediction of image quality in MRI from unseen sites. doi:10.5281/zenodo.7778776.

Esteban O, Goncalves M, and **Markiewicz CJ** (April 2023). SDCflows: Susceptibility Distortion Correction workFLOWS. doi:10.5281/zenodo.7863418.

Esteban O, **Markiewicz CJ**, Blair R, Poldrack RA, and Gorgolewski KJ (March 2023). sMRIPrep: Structural MRI PREProcessing workflows. doi:10.5281/zenodo.7718239.

Esteban O, **Markiewicz CJ**, Goncalves M, Blair R, Berleant SL, Poldrack RA, and Gorgolewski KJ (April 2023). NIWorkflows: NeuroImaging Workflows. doi:10.5281/zenodo.7818175.

Esteban O, **Markiewicz CJ**, Goncalves M, Provins C, Kent JD, DuPre E, et al. (April 2023). fMRIPrep: a robust preprocessing pipeline for functional MRI. doi:10.5281/zenodo.7863421.

Goncalves M, **Markiewicz CJ**, Esteban O, Feczko E, Poldrack RA, and Fair DA (January 2023). NiBabies: a robust preprocessing pipeline for infant functional MRI. doi:10.5281/zenodo.7562647.

Jarecka D, Goncalves M, **Markiewicz CJ**, Esteban O, Lo N, Kaczmarzyk J, et al. (February 2023). nipype/pydra: 0.22. doi:10.5281/zenodo.7679525.

Yarkoni T, **Markiewicz CJ**, de la Vega A, Gorgolewski KJ, Salo T, Halchenko YO, et al. (April 2023). PyBIDS: Python tools for BIDS datasets. doi:10.5281/zenodo.7868309.

Esteban O, **Markiewicz CJ**, Burns C, Goncalves M, Jarecka D, Ziegler E, et al. (July 2022). nipy/nipype: 1.8.3. doi:10.5281/zenodo.6834519.

Goncalves M, **Markiewicz CJ**, Moia S, Ghosh S, Poldrack RA, and Esteban O (February 2022). NiTransforms: A Python tool to read, represent, manipulate, and apply n-dimensional spatial transforms. doi:10.5281/zenodo.6311068.

Markiewicz CJ, De La Vega A, Wagner A, Halchenko YO, Finc K, Ciric R, et al. (October 2022). poldracklab/fitlins: 0.11.0. doi:10.5281/zenodo.7217447.

Contributions to Open Source Scientific Software

Blair R, Michael Z, Gorgolewski KJ, Hardcastle N, Hobson-Lowther T, Nishikawa D, et al. (March 2023). bids-validator. doi:10.5281/zenodo.7745913.

Esteban O, Ciric R, **Markiewicz CJ**, Poldrack RA, and Gorgolewski KJ (February 2023). TemplateFlow Client: Accessing the library of standardized neuroimaging standard spaces. doi:10.5281/zenodo.7600765.

Halchenko YO, Hanke M, Heunis S, **Markiewicz CJ**, Mönch C, Poldrack B, et al. (March 2023). DataLad-next extension. doi:10.5281/zenodo.7746476.

Halchenko YO, Visconti di Oleggio Castello M, Hanke M, Gors J, Szczepanik M, Barnes C, et al. (February 2023). duecredit/duecredit: 0.9.2. doi:10.5281/zenodo.7595105.

Hanke M, Halchenko YO, Poldrack B, Meyer K, Solanky DS, Alteva G, et al. (May 2023). datalad/datalad: 0.18.4. doi:10.5281/zenodo.7941339.

The tedana Community, Ahmed Z, Bandettini PA, Bottenhorn KL, Caballero-Gaudes C, Dowdle LT, et al. (May 2023). ME-ICA/tedana: 23.0.1. doi:10.5281/zenodo.7926293.

Hendrickson TJ, Reiners P, Alexopoulos D, Conan G, Goncalves M, Houghton A, et al. (September 2022). BIBSNet. doi:10.5281/zenodo.7106148.

Waskom M, Larson E, Brodbeck C, Gramfort A, Burns S, Luessi M, et al. (October 2018). PySurfer: 0.9.0. doi:10.5281/zenodo.1443483.

Halchenko Y, Hanke M, Oosterhof NN, Olivetti E, Sederberg PB, Guntupalli S, et al. (November 2015). PyMVPA: 2.4.1. doi:10.5281/zenodo.33988.

Published Methods

Markiewicz CJ (April 2016). philips-cdas v0.1. doi:10.5281/zenodo.49853.

You J, **Markiewicz CJ**, and Bohland JW (July 2015). Formant detection scripts for "Mapping the cortical representation of speech sounds in a syllable repetition task". doi:10.5281/zenodo.51362.

Updated: May, 2023