

# DANIEL CHENG MOYER

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## RESEARCH INTERESTS

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Machine Learning, Neuroimaging, Representation Learning, Human Brain Networks (Connectomics)

## EDUCATION AND TRAINING

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**Massachusetts Institute of Technology, CSAIL** *September 2019 - Present*

Postdoc

*Supervisor: Polina Golland*

**University of Southern California** *August 2019*

Ph.D. in Computer Science

*Advisors: Greg Ver Steeg and Paul Thompson*

*Dissertation Title: Representation Problems in Brain Imaging*

**University of California, Los Angeles** *June 2014*

B.S. in Mathematics of Computation, Minor in Statistics

*Department and Latin Honors*

## RESEARCH EXPERIENCE

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**Massachusetts Institute of Technology** *September 2019 - Present*

*Post-Doc*

*Cambridge, MA*

- Brain and Fetal Imaging Methods: [2,3,26]
- Other Projects: [4]

**Stevens Neuroimaging and Informatics Institute** *March 2015 - August 2019*

*Graduate Research Assistant*

*Los Angeles, CA*

- Brain Connectivity: [13,21,22] and [15-19]
- Other projects: [10-12] and [14]

**Information Sciences Institute** *March 2015 - August 2019*

*Graduate Research Assistant*

*Marina del Rey, CA*

- Invariant Representations [6,9]

**OpenMail** *Summer 2016*

*Intern (Data Science)*

*Venice, CA*

- CTR analysis and CTR optimization system design, keyword analysis and generation.

**Center for the Study of Choice** *January 2013 - June 2015*

*Independent Contractor, ARC Project ID: LP0990750*

*Sydney, New South Wales, Australia*

- Data collection/warehousing, topic models for analysis of forum content. Related Paper: [24]

**UCLA REU/Guided Research** *August 2011 - August 2014*

*Undergraduate Researcher*

*Los Angeles, CA*

- UCLA Applied Math REU: Related Paper [20] and Presentations [31,32].
- Semel Institute: Related Paper [25] and Presentations [33-36].

## AWARDS AND SERVICE

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### Service:

Reviewer for IEEE International Symposium on Biomedical Imaging  
Reviewer for [the Journal of ] Scientific Reports  
Reviewer for the Journal of Alzheimer’s Disease  
Reviewer for IEEE Transactions on Image Processing  
Reviewer for Human Brain Mapping  
Reviewer for Neuroimage  
Reviewer for NeurIPS  
Reviewer for ICLR  
Session Chair for SIPAIM 2015 (Imaging: Connectomics)

### Awards:

USC CSCI Dept. Symposium Best Poster Fall 2019  
MICCAI-CDMRI ’18 Best Oral Presentation Fall 2018  
MICCAI Young Scientist Award Fall 2016

### Funding/Fellowships:

NSF Graduate Research Fellowship Program (NSF GRFP) Fall 2016–August 2019  
NSF GRFP Honorable Mention Spring 2015  
Viterbi Graduate Fellowship Fall 2014–Spring 2016

### Teaching Experience:

Teaching Assistant, USC CSCI 103 Spring 2016  
Lab Assistant (Teaching Role), UCLA PIC Lab Fall 2012–Spring 2014

### Invited Talks:

BMIC Student Seminar (ETH-Zurich) July ‘21  
Stanford Medical Vision Seminar May ‘21  
Stanford CNS Lab April ‘21  
DIPY Workshop March ‘21, March ‘20  
MIT-CSAIL Biomedical Imaging and Analysis Seminar March ‘17, January ‘19

## PRE-PRINTS

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[1] Hrayr Harutyunyan, Daniel Moyer, Hrant Khachatryan, Greg Ver Steeg, Aram Galstyan *Efficient Covariance Estimation from Temporal Data* Pre-print, <https://arxiv.org/abs/1905.13276>

## PUBLICATIONS

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- [2] Daniel Moyer, Esra Abaci Turk, P Ellen Grant, William M Wells, Polina Golland *Equivariant Filters for Efficient Tracking in 3D Imaging*, MICCAI, 2021.
- [3] Ruizhi Liao, Daniel Moyer, Miriam Cha, Keegan Quigley, Seth Berkowitz, Steven Horng, Polina Golland, and William M Wells *Multimodal Representation Learning via Maximization of Local Mutual Information*, MICCAI, 2021.
- [4] Daniel Moyer, Polina Golland *Harmonization and the Worst Scanner Syndrome*, MedNeurIPS, 2020.
- [5] A Kurmukov, Y Denisova, D Moyer, N Jahanshad, PM Thompson, B Gutman, *Optimizing Connectivity-driven Brain Parcellation using Ensemble Clustering*, Brain Connectivity, April 2020.
- [6] Daniel Moyer, Greg Ver Steeg, Chantal M. W. Tax, Paul M. Thompson, *Scanner Invariant Representations for Diffusion MRI Harmonization*, Magn Reson in Med., 2020; 00: 1-16.

- [7] Hrayr Harutyunyan, Daniel Moyer, Greg Ver Steeg, Aram Galstyan *Fast Structure Learning with Modular Regularization*, Neural Information Processing Systems (NeurIPS) 2019.
- [8] Rob Brekelmans, Daniel Moyer, Aram Galstyan, Greg Ver Steeg *Exact Rate-Distortion in Autoencoders via Echo Noise*, Neural Information Processing Systems (NeurIPS) 2019.
- [9] Daniel Moyer, Shuyang Gao, Rob Brekelmans, Greg Ver Steeg, and Aram Galstyan, *Invariant Representation without Adversarial Training*, Neural Information Processing Systems (NIPS) 2018.
- [10] Fabrizio Pizzagalli, Guillaume Auzias, Armand Amini, Joshua Faskowitz, Faisal Rashid, Daniel Moyer, Peter Kochunov, Denis Rivire, Jean-Francois Mangin, Paul M Thompson, Neda Jahanshad, *Sulcal-based morphometry in Parkinsons disease: a study of reliability and disease effects*, SIPAIM, 2018.
- [11] Fabian W Corlier, Daniel Moyer, Meredith N Braskie, Paul M Thompson, Guillaume Dorothee, Marie Claude Potier, Marie Sarazin, Michel Bottlaender, Julien Lagarde, *Automatic classification of cortical thickness patterns in Alzheimers disease patients using the Louvain modularity clustering method*, SIPAIM, 2018.
- [12] Daniel Moyer, Paul M. Thompson, and Greg Ver Steeg, *Measures of Tractography Convergence*, MICCAI-CDMRI, 2018.
- [13] Daniel Moyer, Boris Gutman, Neda Jahanshad, Joshua Faskowitz, Paul M. Thompson, *Continuous Representations of Brain Connectivity using Spatial Point Processes*, Medical Image Analysis (MedIA) 2017.
- [14] Dmitry Petrov, Alexander Ivanov, Joshua Faskowitz, Boris Gutman, Daniel Moyer, Julio Villalon, Neda Jahanshad, Paul M. Thompson *Evaluating 36 Methods to Generate Structural Connectomes Using Pairwise Classification*, MICCAI, September 2017.
- [15] Daniel Moyer, Boris Gutman, Neda Jahanshad, and Paul M. Thompson, *Product Space Decompositions for Continuous Representations of Brain Connectivity*, MICCAI-MLMI, September 2017.
- [16] Daniel Moyer, Boris Gutman, Neda Jahanshad, and Paul M. Thompson, *A Restaurant Process Mixture Model for Connectivity Based Parcellation of the Cortex*, IPMI, June 2017.
- [17] Dmitry Isaef, Boris Gutman, Daniel Moyer, Joshua Faskowitz, and Paul M. Thompson, *Cortical Connectome Registration Using Spherical Daemons*, SIPAIM, November 2017 (Oral Presentation).
- [18] Daniel Moyer, Boris Gutman, Neda Jahanshad, Joshua Faskowitz, and Paul M. Thompson, *A Continuous Model of Cortical Connectivity*, MICCAI, October 2016 (Oral Presentation, Student Travel Award, Young Scientist Award).
- [19] Daniel Moyer, Boris Gutman, Neda Jahanshad, Joshua Faskowitz, and Paul M. Thompson, *An Empirical Study of Continuous Connectivity Degree Sequence Equivalents*, MICCAI-BACON, October 2016 (Oral Presentation).
- [20] Eric Le Lai, Daniel Moyer, Baichuan Yuan, Eric Fox, Blake Hunter, Andrea L. Bertozzi, Jeffery Brantingham, *Topic Time Series Analysis of Microblogs*, IMA Journal of Applied Math (2016) 81 (3): 409-431.
- [21] Daniel Moyer, Boris Gutman, Gautam Prasad, Joshua Faskowitz, Greg Ver Steeg, and Paul M. Thompson, *Blockmodels for Connectome Analysis* SIPAIM, July 2015
- [22] Daniel Moyer, Boris Gutman, Gautam Prasad, Greg ver Steeg, and Paul M. Thompson, *Mixed Membership Stochastic Blockmodels for the Human Connectome*, MICCAI-BAMBI Workshop, 2015.
- [23] Talia M. Nir, Julio E. Villalon, Boris Gutman, Daniel Moyer, Neda Jahanshad, Clifford R. Jack Jr, Michael Weiner, Paul M. Thompson, *Alzheimer's Disease Classification with Novel Microstructural Metrics from Diffusion-Weighted MRI*, MICCAI-CDMRI Workshop, October 2015

[24] Daniel Moyer, Thayne Dye, Samuel L. Carson, Richard T. Carson, and David Goldbaum, *Determining the Influence of Reddit Posts on Wikipedia Pageviews*, ICWSM Workshop on Wikipedia, 2015.

[25] Pamela Douglas, Edward Lau, Ariana Anderson, Wesley Kerr, Austin Head, Margalit Aliza Wollner, Daniel Moyer, Michael Durnhofer, Wei Li, Jen Bramen, and Mark S. Cohen, *Single Trial Decoding of Belief Decision Making from EEG and fMRI Data Using ICA Features*, *Frontiers in Human Neuroscience*, 2013, 7:392. PMID: 23914164

## CONFERENCE ABSTRACTS

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[26] Malte Hoffman, Daniel C Moyer, Lawrence Zhang, Polina Golland, P Ellen Grant, Borjan Gagoski, Andre JW van der Kouwe, *Learning-based automatic field-of-view positioning for fetal-brain MRI*, ISMRM 2021.

[27] Lipeng Ning, Elisenda Bonet-Carne, Francesco Grussu, Farshid Seppehrband, Enrico Kaden, ..., Daniel Moyer, ..., Derek K Jones, Chantal WM Tax, *Cross-scanner and cross-protocol harmonisation of multi-shell diffusion MRI data: open challenge and evaluation results*, ISMRM 2019.

[28] Daniel Moyer, Paul M. Thompson, and Greg Ver Steeg, *Measures of Tractography Convergence*, OHBM 2018.

[29] Daniel Moyer, Boris Gutman, Neda Jahanshad, and Paul M. Thompson, *A Restaurant Process Mixture Model for Connectivity Based Parcellation of the Cortex*; OHBM 2017.

[30] Daniel Moyer, Boris Gutman, Neda Jahanshad, and Paul Thompson, *Cluster Weighted Regressions for Connectome Analysis*; OHBM, 2016

[31] Daniel Moyer, Douglas de Jesus, and Lingge Li, *Evolutionary Agent-Based Models for Contagion*; Pacific Coast Undergraduate Mathematics Conference, Los Angeles 2014 (Oral Presentation)

[32] Douglas de Jesus, Lingge Li, and Daniel Moyer, *Metaheuristics Using Agent-Based Models for Swarm and Contagion*; Joint Math Meeting, Baltimore 2014

[33] Douglas P.K., Moyer D., Cohen M.S., *EEG-fMRI Coupling is Task Related and Spectrally Dependent*; SfN 2013 (Oral Presentation)

[34] Douglas P.K., Moyer D., Cohen M.S., *Co-localizing EEG and fMRI in the Spatial Domain*; OHBM, 19th Annual Meeting, Seattle, Washington 2013 (Oral Presentation)

[35] Pamela Douglas & Daniel Moyer, *Temporal Kernel Canonical Correlation Analysis: Deconvolving EEG/fMRI Signals in Space and Time*; OHBM, Beijing 2012

[36] Pamela Douglas, Daniel Moyer, and Mark S. Cohen, *Co-localizing EEG and fMRI in Space*; SfN, 2012