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EDUCATION

2018– **Stanford University**
Ph.D., Bioengineering
In progress

2010–2015 **Pomona College**
B.A., Neuroscience
GPA: 3.8

ACADEMIC POSITIONS

2018– **Doctoral research assistant.** Stanford University, Department of Bioengineering. Dissertation project: Developing [a fully differentiable scientific workflow for analysis of functional brain images](#). Re-cast modern protocols for processing 4-dimensional medical image time series data as differentiable neural network layers. Formulated custom loss functions, and used domain knowledge to devise custom initialisations and regularisations. Re-implemented neural network modules based on prior literature reports and enhanced them for flexible application to new datasets. Built program modules for uniform and efficient data ingestion, leveraging state-of-the-art solutions and frameworks. Implemented software engineering patterns and principles of test-driven development. Contributed to open-source software projects for preprocessing and analysis of functional brain images, several of which are used widely in the neuroimaging community.

2015–2018 **Senior image analyst.** University of Pennsylvania, Department of Psychiatry. Developed [a modular system for processing of multimodal neuroimages](#) (lead). Extended software functionality, improved reproducibility and portability, undertook independent investigations of static and dynamic correlates of neurodevelopment in functional MRI, and provided professional consultation and support services regarding image processing to research groups across the University. Managed, processed, and analysed data from the 2000+ subject multimodal Philadelphia Neurodevelopmental Cohort (PNC) and a multi-study psychiatric imaging cohort.

TEACHING EXPERIENCE

2021 **BIOE80: Introduction to bioengineering.** Stanford University, Department of Bioengineering.

2020 **BIOE301C: Diagnostic devices laboratory.** Stanford University, Department of Bioengineering.

2015 **NEUR102: Neuroethology laboratory.** Pomona College, Department of Neuroscience.

2014 **NEUR101: Introduction to neurosciences.** Pomona College, Department of Neuroscience.

ACADEMIC AND PROFESSIONAL HONOURS

2018 Training in Biomedical Imaging Instrumentation (TBI2) Fellowship, Stanford University

2015 Faculty for Undergraduate Neuroscience Travel Grant

2015 The Senior Prize in Neuroscience, Pomona College

2013–2015 Pomona College Scholar

PUBLICATIONS

Following is a representative subset of 30 peer-reviewed publications. For a complete list, please visit [my Google Scholar page](#).

- 1 Zhou D, CW Lynn CW, Z Cui Z, **Ciric R**, Baum GL, Moore TM, Roalf DR, Detre JA, Gur RC, Gur RE, Satterthwaite TD, Bassett DS (2022) [Efficient coding in the economics of human brain connectomics](#). *Network Neuroscience* 6(1):234-74.
- 2 **Ciric R**, Thompson WH, Moore TM, Lorenz R, Goncalves M, MacNicol E, Markiewicz C, Halchenko Y, Ghosh S, Gorgolewski K, Poldrack RA, Esteban O (Under review) [TemplateFlow: FAIR-sharing of multi-scale, multi-species brain models](#). Preprint posted.
- 3 Gu S, Xia CH, **Ciric R**, Moore TM, Gur RC, Gur RE, Satterthwaite TD, Bassett DS (2020) [Unifying modular and core-periphery structure in functional brain networks over development](#). *Cerebral Cortex* 30(3):1087-1102.
- 4 Cui Z, Stiso J, Baum GL, Kim JZ, Roalf DR, Betzel RF, Gu S, Lu Z, Xia CH, He X, **Ciric R**, Oathes DJ, Moore TM, Shinohara RT, Ruparel K, Davatzikos C, Pasqualetti F, Gur RE, Gur RC, Bassett DS, Satterthwaite TD (2020) [Optimization of energy state transition trajectory supports the development of executive function during youth](#). *eLife* 9:e53060.

- 5 Cornblath EJ, Ashourvan A, Kim JZ, Betzel RF, **Ciric R**, Adebimpe A, Baum GL, He X, Ruparel K, Moore TM, Gur RC, Gur RE, Shinohara RT, Roalf DR, Satterthwaite TD, Bassett DS (2020)
[Temporal sequences of brain activity at rest are constrained by white matter structure and modulated by cognitive demands](#). *Communications Biology* 3(1):1-12.
- 6 Esteban O, **Ciric R**, Finc K, Blair RW, Markiewicz CJ, Moodie CA, Kent JD, Goncalves M, DuPre E, Gomez DEP, Ye Z, Salo T, Valabregue R, Amlien IK, Liem F, Jacoby N, Stojic H, Cieslak M, Urchs S, Halchenko YO, Ghosh SS, De La Vega A, Yarkoni T, Wright JAK, Thompson WH, Poldrack RA, Gorgolewski KJ (2020)
[Analysis of task-based functional MRI data preprocessed with fMRIPrep](#). *Nature Protocols*.
- 7 Esteban O, Markiewicz CJ, Goncalves M, Kent JD, DuPre E, **Ciric R**, Salo T, Pinsard B, Blair RW, Poldrack RA, Gorgolewski K et al. (2019-present)
[fMRIPrep: a robust preprocessing pipeline for functional MRI](#). Zenodo 10.1038/s41592-018-0235-4.
- 8 Satterthwaite TD, **Ciric R**, Roalf DR, Davatzikos C, Bassett DS, Wolf DH (2019)
[Motion artifact in studies of functional connectivity: characteristics and mitigation strategies](#). *Human Brain Mapping* 40(7):2033-51.
- 9 Osmanlioglu Y, Tunc B, Parker D, Elliott MA, Baum GL, **Ciric R**, Satterthwaite TD, Gur RE, Gur RC, Verma R (2019)
[System-level multimodal connectomic coupling in the brain with network communication modeling](#). *NeuroImage* 199:93-104.
- 10 Jirsaraie RJ, Kaczkurkin AN, Rush S, Piiwaa K, Adebimpe A, Bassett DS, Bourque J, Calkins ME, Cieslak M, **Ciric R**, Cook PA, Davila D, Elliott MA, Leibenluft E, Murtha K, Roalf DR, Rosen AFG, Ruparel K, Shinohara RT, Sotiras A, Davatzikos C, Satterthwaite TD (2019)
[Accelerated cortical thinning within structural brain networks is associated with irritability in youth](#). *Neuropsychopharmacology* 44(13):2254-62
- 11 Duprat R, Linn K, Satterthwaite TD, **Ciric R**, Sheline Y, Platt M, Gold J, Kable J, Adams G, Kalamveetil-Meethal S, Dallstream A, Long H, Scully M, Shinohara RT, Oathes D (2019)
[Functional connectivity as a tool to individualize DLPFC targeting in TMS](#). *Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation*.
- 12 Kaczkurkin AN, Park SS, Sotiras A, Moore TM, Calkins ME, Cieslak M, Rosen AFG, **Ciric R**, Xia CH, Cui Z, Sharma A, Wolf DH, Ruparel K, Pine DS, Shinohara RT, Roalf DR, Gur RC, Davatzikos C, Gur RE, Satterthwaite TD (2019)
[Evidence for dissociable linkage of dimensions of psychopathology to brain structure in youths](#). *American Journal of Psychiatry*.
- 13 Tooley UA, Mackey AP, **Ciric R**, Ruparel K, Moore TM, Gur RC, Gur RE, Satterthwaite TD, Bassett DS (2019)
[Associations between neighborhood SES and functional brain network development](#). *Cerebral Cortex*.
- 14 Lydon-Staley D, **Ciric R**, Satterthwaite TD, Bassett DS (2019)
[Evaluation of confound regression strategies for the mitigation of motion artifact in studies of dynamic resting state functional connectivity](#). *Network Neuroscience* 3(2):427-54.
- 15 **Ciric R**, Rosen AFG, Erus G, Cieslak M, Adebimpe A, Cook PA, Bassett DS, Davatzikos C, Wolf DH, Satterthwaite TD (2018)
[Mitigating head motion artefact in functional connectivity MRI](#). *Nature Protocols*.
- 16 Xia CH, Ma Z, **Ciric R**, Gu S, Betzel RF, Kaczkurkin AN, Calkins ME, Cook PA, Garcia de la Garza A, Vandekar S, Moore TM, Roalf DR, Ruparel K, Wolf DH, Davatzikos C, Gur RC, Gur RE, Shinohara RT, Bassett DS, Satterthwaite TD (2018)
[Linked dimensions of psychopathology and connectivity in functional brain networks](#). *Nature Communications* 9(1):1-14.
- 17 Baum GL, Roalf DR, Cook PA, **Ciric R**, Rosen AFG, Xia CH, Elliott MA, Ruparel K, Verma R, Tunc B, Parker D, Gur RC, Gur RE, Bassett DS, Satterthwaite TD (2018)
[The impact of in-scanner head motion on structural connectivity derived from diffusion tensor imaging](#). *NeuroImage* 173:275-86.
- 18 Medaglia JD, Satterthwaite TD, Kelkar A, **Ciric R**, Moore TM, Ruparel K, Gur RC, Gur RE, Bassett DS (2018)
[Brain state expression and transitions are related to complex executive cognition in normative neurodevelopment](#). *NeuroImage*.
- 19 Rosen AFG, Roalf DR, Ruparel K, Blake J, Seelaus K, Villa P, **Ciric R**, Cook PA, Davatzikos C, Elliott MA, Garcia de La Garza A, Gennatas ED, Quarmley M, Schmitt EJ, Shinohara RT, Tisdall MD, Craddock C, Gur RE, Gur RC, Satterthwaite TD (2018)
[Quantitative assessment of structural image quality](#). *NeuroImage* 169:407-18.
- 20 Pehlivanova M, Wolf DH, Sotiras A, Kaczkurkin A, Moore TM, **Ciric R**, Cook PA, Garcia de La Garza A, Rosen AFG, Ruparel K, Sharma A, Shinohara RT, Roalf DR, Gur RC, Davatzikos C, Gur RE, Kable JW, Satterthwaite

- TD (2018)
[Diminished cortical thickness is associated with impulsive choice in adolescence.](#) *Journal of Neuroscience*.
- 21 Löffler LAK, Radke S, Habel E, **Ciric R**, Satterthwaite TD, Schneider F, Derntl B (2018)
[The regulation of positive and negative emotions through instructed causal attributions in lifetime depression – a functional magnetic resonance imaging study.](#) *NeuroImage: Clinical* 20:1233-45.
- 22 Kaczurkin AN, Moore TM, Calkins ME, **Ciric R**, Detre JA, Elliott MA, Foa EB, Garcia de la Garza A, Roalf DR, Rosen AFG, Ruparel K, Shinohara RT, Xia CH, Wolf DH, Gur RE, Gur RC, Satterthwaite TD (2018)
[Common and dissociable regional cerebral blood flow differences associate with dimensions of psychopathology across categorical diagnoses.](#) *Molecular Psychiatry* 23(10):1981-9.
- 23 Vandekar SN, Satterthwaite TD, Rosen AFG, **Ciric R**, Roalf DR, Ruparel K, Gur RC, Gur RE, Shinohara RT (2018)
[Faster family-wise error control for neuroimaging with a parametric bootstrap.](#) *Biostatistics* 19(4):497-513.
- 24 **Ciric R**, Wolf DH, Power JD, Roalf DR, Baum GL, Ruparel K, Shinohara RT, Elliott MA, Eickhoff SB, Davatzikos C, Gur RC, Gur RE, Bassett DS, Satterthwaite TD (2017)
[Benchmarking participant-level confound regression strategies for the control of motion artifact in studies of functional connectivity.](#) *NeuroImage*.
- 25 **Ciric R**, Nomi JS, Uddin LQ, Satpute AB (2017)
[Contextual connectivity: A framework for understanding the intrinsic dynamic architecture of large-scale functional brain networks.](#) *Scientific Reports*.
- 26 Baum GL, **Ciric R**, Roalf DR, Betzel RF, Moore TM, Shinohara RT, Kahn AE, Quarmley M, Cook PA, Elliott MA, Ruparel K, Gur RE, Gur RC, Bassett DS, Satterthwaite TD (2017)
[Modular segregation of structural brain networks supports the development of executive function in youth.](#) *Current Biology*.
- 27 Gennatas ED, Avants B, Wolf D, Satterthwaite TD, Ruparel K, **Ciric R**, Hakonarson H, Gur RE, Gur RC (2017)
[Age-related effects and sex differences in gray matter density, volume, mass, and cortical thickness from childhood to young adulthood.](#) *Journal of Neuroscience* 37(20):5065–73.
- 28 Sharma A, Wolf DH, **Ciric R**, Kable JW, Moore TM, Vandekar SN, Katchmar N, Daldal A, Ruparel K, Davatzikos C, Elliott MA, Calkins ME, Shinohara RT, Bassett DS, Satterthwaite TD (2017)
[Connectome-wide analysis reveals common dimensional reward deficits across mood and psychotic disorders.](#) *American Journal of Psychiatry*.
- 29 Chai L, Khambhati A, **Ciric R**, Moore T, Gur RC, Gur RE, Satterthwaite TD, Bassett DS (2017)
[Evolution of brain networks during neurodevelopment.](#) *Network Neuroscience* 1(1):14–30.
- 30 Kaczurkin AN, Moore TM, Ruparel K, **Ciric R**, Calkins ME, Shinohara RT, Elliott MA, Hopson R, Roalf DR, Vandekar SN, Gennatas ED, Wolf DH, Scott JC, Pine DS, Leibenluft E, Detre JA, Foa EB, Gur RE, Gur RC, Satterthwaite TD (2016)
[Elevated amygdala perfusion mediates developmental sex differences in trait anxiety.](#) *Biological Psychiatry* 80(10):775–85.

SERVICE

Ad hoc reviewer NeuroImage
Ad hoc reviewer Human Brain Mapping
Ad hoc reviewer PLoS ONE
Ad hoc reviewer Brain Structure and Function

SOFTWARE AND PROGRAMMING

Languages: Python; shell; MATLAB; R; LaTeX
Other: Git; PyTorch; LibreOffice suite; SPSS; GIMP (raster graphics software; Photoshop analogue); Inkscape (vector graphics software; Illustrator analogue); virtualisation

SOFTWARE AND PROGRAMMING

Languages: Proficient in Python, shell, MATLAB, R. Some experience working with C, C++, LaTeX, and Java.
Imaging: Contributor to Nipype; fMRIPrep; Niworkflows; TemplateFlow. Experience with FSL; AFNI; ANTs; SPM; GIFT; BCT.
Other: Proficiency with PyTorch, SciPy suite, pandas, git, distributed high-performance computing (HPC), GIMP, Inkscape. Working experience with test-driven development, containerisation (e.g., Docker), CI, software engineering.

RELEVANT COURSEWORK

Machine learning, statistical learning, convolutional neural networks, decision-making under uncertainty, artificial intelligence, deep generative models, data structures and algorithms, computer systems; convex optimisation, linear dynamical systems, information theory, neural network models of cognition, brain networks (network science), theoretical (computational) neuroscience