



Manish Saggar

Assistant Professor (Research) of Psychiatry and Behavioral Sciences (Interdisciplinary Brain Science Research)

Psychiatry and Behavioral Sciences - Interdisciplinary Brain Sciences

Bio

BIO

Dr. Manish Saggar is an Assistant Professor in Computational Neuropsychiatry at Stanford University and currently directs the Brain Dynamics Lab. The overarching goal of his lab is to develop computational methods that could allow for anchoring psychiatric diagnosis into biological features (e.g., neural circuits, spatiotemporal neurodynamics). His lab is funded through an NIH Director's New Innovator Award (DP2), an NIMH R01, and a faculty scholar award from Stanford's Maternal and Child Health Research Institute. He has previously received a career development award (K99/R00) from the NIMH and BBRF's NARSAD Young Investigator Award. His work has been recognized by several local and national and international awards. His lab excels in developing data-driven computational methods to generate clinically and behaviorally relevant insights from high-dimensional biological data (e.g., neuroimaging) without necessarily averaging the data at the outset. The lab also actively pursue developing novel technologies for experimental design and data collection for enhancing human cognition (e.g., creativity and collaboration). Dr. Saggar received his Ph.D. in Computer Science from the University of Texas at Austin and later received postdoctoral training in Psychiatry from Stanford University School of Medicine.

ACADEMIC APPOINTMENTS

- Assistant Professor (Research), Psychiatry and Behavioral Sciences - Interdisciplinary Brain Sciences
- Member, Bio-X
- Member, Wu Tsai Human Performance Alliance
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Tashia and John Morgridge Endowed Faculty Scholar in Pediatric Translational Medicine, Stanford Maternal & Child Health Research Institute (2020-25)
- Travel Fellowship Award, Society of Biological Psychiatry (SOBP) (2020)
- International Fellow, Institute for Scientific Interchange Foundation, Italy (2019-2022)
- Annual Chairman's Award for Advancing Science, Department of Psychiatry & Behavioral Sciences, Stanford University (2019)
- NIH Director's New Innovator Award (DP2), National Institute of Health (2018-2023)
- NARSAD Young Investigator Grant, Brain & Behavior Research Foundation (2016-2018)
- Innovator Grant, Department of Psychiatry & Behavioral Sciences, Stanford University (2016)
- NIH Career Development Award (K99/R00), National Institute of Mental Health (2015-2020)
- Child Health Research Institute (CHRI) Postdoctoral Grant, Lucile Packard Foundation for Children's Health (LPFCH) (2013-2014)
- Seed-grant Award, Stanford's Center for Cognitive and Neurobiological Imaging (CNI). (2012-2013)

- Francisco J. Varela Memorial Grant Award, Mind and Life Institute (2006-2011)
- Merit Scholarship, Indian Institute of Information Technology, Allahabad (IIIT-A), India (2001-2005)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Editorial Board Member, NeuroImage (Elsevier) (2020 - present)
- Mentor, Organization of Human Brain Mapping Online Mentoring Program (2020 - present)
- Editorial Board Member, Scientific Reports (Nature Research Journal) (2017 - present)
- Executive Board Member, Society for the Neuroscience of Creativity (2017 - present)

PROFESSIONAL EDUCATION

- Faculty Fellow, Stanford Byers Center for Bio Design , Bio Design (2017)
- Postdoctoral Fellowship, Stanford University School of Medicine , Psychiatry (2014)
- Doctor of Philosophy, University of Texas at Austin , Computer Science (2011)
- Master of Science, University of Texas at Austin , Computer Science (2009)
- Bachelors in Technology, Indian Institute of Information Technology , Information Technology (2005)

PATENTS

- Manish Saggar. "United States Patent 16/171,255 Systems and Methods for Mapping Neuronal Circuitry and Clinical Applications Thereof", Leland Stanford Junior University, Jan 1, 2019

LINKS

- Brain Dynamics Lab: <http://bdl.stanford.edu>

Research & Scholarship

RESEARCH INTERESTS

- Brain and Learning Sciences
- Data Sciences
- Psychology
- Research Methods

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Dr. Manish Saggar is an Assistant Professor in Computational Neuropsychiatry at Stanford University and currently directs the Brain Dynamics Lab. The overarching goal of his lab is to develop computational methods that could allow for anchoring psychiatric diagnosis into biological features (e.g., neural circuits, spatiotemporal neurodynamics). His lab is funded through an NIH Director's New Innovator Award (DP2), an NIMH R01, and a faculty scholar award from Stanford's Maternal and Child Health Research Institute. He has previously received a career development award (K99/R00) from the NIMH and BBRF's NARSAD Young Investigator Award. His work has been recognized by several local (e.g., Department's Innovator Award and Excellence in Advancing Science Award) and national and international awards (e.g., Institute for Scientific Interchange, Italy, Fellow). His lab excels in developing data-driven computational methods to generate clinically and behaviorally relevant insights from high-dimensional biological data (e.g., neuroimaging) without necessarily averaging the data at the outset. They also actively pursue developing novel technologies for experimental design and data collection for enhancing human cognition (e.g., creativity and collaboration). Dr. Saggar received his Ph.D. in Computer Science from the University of Texas at Austin and later received postdoctoral training in Psychiatry from Stanford University School of Medicine.

CLINICAL TRIALS

- Examining the Effects of Regular Brief Internet-based Meditation Practice on Mental Health and Well Being, Recruiting

Teaching

COURSES

2023-24

- Methodology of Research in Behavioral Sciences: PSYC 250 (Win)

2022-23

- Methodology of Research in Behavioral Sciences: PSYC 250 (Win)

2021-22

- Methodology of Research in Behavioral Sciences: PSYC 250 (Win)

2020-21

- Methodology of Research in Behavioral Sciences: PSYC 250 (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Grace Huckins

Postdoctoral Faculty Sponsor

Shaun Quah

Publications

PUBLICATIONS

- **Deconstructing the Mapper algorithm to extract richer topological and temporal features from functional neuroimaging data.** *bioRxiv : the preprint server for biology*
Ha#egan, D., Geniesse, C., Chowdhury, S., Saggar, M.
2023
- **Cross-attractor modeling of resting-state functional connectivity in psychiatric disorders.** *NeuroImage*
Sun, Y., Zhang, M., Saggar, M.
2023: 120302
- **Brain mitochondrial diversity and network organization predict anxiety-like behavior in male mice.** *Nature communications*
Rosenberg, A. M., Saggar, M., Monzel, A. S., Devine, J., Rogu, P., Limoges, A., Junker, A., Sandi, C., Mosharov, E. V., Dumitriu, D., Anacker, C., Picard, M.
2023; 14 (1): 4726
- **Network effects of Stanford Neuromodulation Therapy (SNT) in treatment-resistant major depressive disorder: a randomized, controlled trial.** *Translational psychiatry*
Batail, J., Xiao, X., Azeez, A., Tischler, C., Kratter, I. H., Bishop, J. H., Saggar, M., Williams, N. R.
2023; 13 (1): 240
- **Temporal Mapper: Transition networks in simulated and real neural dynamics** *NETWORK NEUROSCIENCE*
Zhang, M., Chowdhury, S., Saggar, M.
2023; 7 (2): 431-460
- **Development of top-down cortical propagations in youth.** *Neuron*
Pines, A., Keller, A. S., Larsen, B., Bertolero, M., Ashourvan, A., Bassett, D. S., Cieslak, M., Covitz, S., Fan, Y., Feczko, E., Houghton, A., Rueter, A. R., Saggar, et al
2023
- **Current opinions on the present and future use of functional near-infrared spectroscopy in psychiatry.** *Neurophotonics*
Li, R., Hosseini, H., Saggar, M., Balters, S. C., Reiss, A. L.

2023; 10 (1): 013505

- **Brief intensive social gaze training reorganizes functional brain connectivity in boys with fragile X syndrome.** *Cerebral cortex (New York, N.Y. : 1991)*
Saggar, M., Bruno, J. L., Hall, S. S.
2022
- **Dynamic autonomic nervous system states arise during emotions and manifest in basal physiology.** *Psychophysiology*
Pasquini, L., Noohi, F., Veziris, C. R., Kosik, E. L., Holley, S. R., Lee, A., Brown, J. A., Roy, A. R., Chow, T. E., Allen, I., Rosen, H. J., Kramer, J. H., Miller, et al
2022: e14218
- **Dysfunctional Cortical Gradient Topography in Treatment-Resistant Major Depressive Disorder.** *Biological psychiatry. Cognitive neuroscience and neuroimaging*
Pasquini, L., Fryer, S. L., Eisendrath, S. J., Segal, Z. V., Lee, A. J., Brown, J. A., Saggar, M., Mathalon, D. H.
2022
- **Neural resources shift under Methylphenidate: a computational approach to examine anxiety-cognition interplay.** *NeuroImage*
Saggar, M., Bruno, J., Gaillard, C., Claudino, L., Ernst, M.
2022: 119686
- **Precision dynamical mapping using topological data analysis reveals a hub-like transition state at rest.** *Nature communications*
Saggar, M., Shine, J. M., Liegeois, R., Dosenbach, N. U., Fair, D.
2022; 13 (1): 4791
- **DISSOCIABLE SIGNATURES OF DYNAMIC AUTONOMIC ACTIVITY DURING EVOKED EMOTIONS AND REST**
Pasquini, L., Noohi, F., Veziris, C., Kosik, E., Lee, A., Brown, J., Holley, S., Miller, B., Saggar, M., Seeley, W., Sturm, V.
WILEY.2022: S141
- **Cross-attractor repertoire provides new perspective on structure-function relationship in the brain.** *NeuroImage*
Zhang, M., Sun, Y., Saggar, M.
2022: 119401
- **NeuMapper: A scalable computational framework for multiscale exploration of the brain's dynamical organization.** *Network neuroscience (Cambridge, Mass.)*
Geniesse, C., Chowdhury, S., Saggar, M.
2022; 6 (2): 467-498
- **Brief, Intense Social Gaze Training Normalizes Functional Brain Connectivity in Boys With Fragile X Syndrome**
Bruno, J., Saggar, M., Hall, S.
ELSEVIER SCIENCE INC.2022: S152
- **Altered canonical and striatal-frontal resting state functional connectivity in children with pathogenic variants in the Ras/mitogen-activated protein kinase pathway.** *Molecular psychiatry*
Bruno, J. L., Shrestha, S. B., Reiss, A. L., Saggar, M., Green, T.
2022
- **Spontaneous and deliberate modes of creativity: Multitask eigen-connectivity analysis captures latent cognitive modes during creative thinking.** *NeuroImage*
Xie, H., Beaty, R. E., Jahanikia, S., Geniesse, C., Sonalkar, N. S., Saggar, M.
2021: 118531
- **Creativity and the Brain: An Editorial Introduction to the Special Issue on the Neuroscience of Creativity.** *NeuroImage*
Saggar, M., Volle, E., Uddin, L. Q., Chrysikou, E. G., Green, A. E.
2021: 117836
- **Thalamocortical connectivity is associated with autism symptoms in high-functioning adults with autism and typically developing adults.** *Translational psychiatry*
Ayub, R. n., Sun, K. L., Flores, R. E., Lam, V. T., Jo, B. n., Saggar, M. n., Fung, L. K.
2021; 11 (1): 93
- **Simplicial and topological descriptions of human brain dynamics.** *Network neuroscience (Cambridge, Mass.)*
Billings, J., Saggar, M., Hlinka, J., Keilholz, S., Petri, G.

2021; 5 (2): 549-568

- **Activation Mutation in the Ras/MAPK Pathway Alters the Functional Resting-State Architecture Underlining Executive Function and Attention**
 Bruno, J., Shrestha, S., Reiss, A., Saggar, M., Green, T.
 SPRINGER NATURE.2020: 177–78
- **Sex Differences in Resting-State Functional Connectivity in High-Functioning Adults With Autism**
 Sun, K., Ayub, R., Lam, V., Saggar, M., Fung, L.
 SPRINGER NATURE.2020: 297–98
- **Finding the neural correlates of collaboration using a three-person fMRI hyperscanning paradigm.** *Proceedings of the National Academy of Sciences of the United States of America*
 Xie, H., Karipidis, I. I., Howell, A., Schreier, M., Sheau, K. E., Manchanda, M. K., Ayub, R., Glover, G. H., Jung, M., Reiss, A. L., Saggar, M.
 2020
- **Thalamic and prefrontal GABA concentrations but not GABAA receptor densities are altered in high-functioning adults with autism spectrum disorder.** *Molecular psychiatry*
 Fung, L. K., Flores, R. E., Gu, M. n., Sun, K. L., James, D. n., Schuck, R. K., Jo, B. n., Park, J. H., Lee, B. C., Jung, J. H., Kim, S. E., Saggar, M. n., Sacchet, et al
 2020
- **Pushing the boundaries of psychiatric neuroimaging to ground diagnosis in biology.** *eNeuro*
 Saggar, M., Uddin, L. Q.
 2019
- **Large expert-curated database for benchmarking document similarity detection in biomedical literature search** *DATABASE-THE JOURNAL OF BIOLOGICAL DATABASES AND CURATION*
 Brown, P., Tan, A., El-Esawi, M. A., Liehr, T., Blanck, O., Gladue, D. P., Almeida, G. F., Cernava, T., Sorzano, C. O., Yeung, A. K., Engel, M. S., Chandrasekaran, A., Muth, et al
 2019
- **Creativity slumps and bumps: Examining the neurobehavioral basis of creativity development during middle childhood** *NEUROIMAGE*
 Saggar, M., Xie, H., Beaty, R. E., Stankov, A. D., Schreier, M., Reiss, A. L.
 2019; 196: 94–101
- **Implementing Evolutionary Optimization to Model Neural Functional Connectivity**
 Maile, K., Saggar, M., Mikkilainen, R., ACM
 ASSOC COMPUTING MACHINERY.2019: 1731–33
- **Generating dynamical neuroimaging spatiotemporal representations (DyNeuSR) using topological data analysis** *NETWORK NEUROSCIENCE*
 Geniesse, C., Sporns, O., Petri, G., Saggar, M.
 2019; 3 (3): 763–78
- **Towards a new approach to reveal dynamical organization of the brain using topological data analysis** *NATURE COMMUNICATIONS*
 Saggar, M., Sporns, O., Gonzalez-Castillo, J., Bandettini, P. A., Carlsson, G., Glover, G., Reiss, A. L.
 2018; 9: 1399
- **Creativity in the Twenty-first Century: The Added Benefit of Training and Cooperation** *DESIGN THINKING RESEARCH: MAKING DISTINCTIONS: COLLABORATION VERSUS COOPERATION*
 Mayseless, N., Saggar, M., Hawthorne, G., Reiss, A., Plattner, H., Meinel, C., Leifer, L.
 2018: 239–49
- **Identification of biotypes in Attention-Deficit/Hyperactivity Disorder, a report from a randomized, controlled trial.** *Personalized medicine in psychiatry*
 Leikauf, J. E., Griffiths, K. R., Saggar, M., Hong, D. S., Clarke, S., Efron, D., Tsang, T. W., Hermens, D. F., Kohn, M. R., Williams, L. M.
 2017; 3: 8-17
- **Altered Brain Network Segregation in Fragile X Syndrome Revealed by Structural Connectomics** *CEREBRAL CORTEX*
 Bruno, J. L., Hosseini, S. M., Saggar, M., Quintin, E., Raman, M. M., Reiss, A. L.
 2017; 27 (3): 2249-2259
- **Compensatory Hyperconnectivity in Developing Brains of Young Children With Type 1 Diabetes** *DIABETES*
 Saggar, M., Tsalikian, E., Mauras, N., Mazaika, P., White, N. H., Weinzimer, S., Buckingham, B., Hershey, T., Reiss, A. L.

2017; 66 (3): 754-762

- **X-Chromosome Effects on Attention Networks: Insights from Imaging Resting-State Networks in Turner Syndrome.** *Cerebral cortex (New York, N.Y. : 1991)*
 Green, T. n., Saggar, M. n., Ishak, A. n., Hong, D. S., Reiss, A. L.
 2017: 1-8
- **Changes in Brain Activation Associated with Spontaneous Improvization and Figural Creativity After Design-Thinking-Based Training: A Longitudinal fMRI Study.** *Cerebral cortex*
 Saggar, M., Quintin, E., Bott, N. T., Kienitz, E., Chien, Y., Hong, D. W., Liu, N., Royalty, A., Hawthorne, G., Reiss, A. L.
 2016
- **Sex differences in neural and behavioral signatures of cooperation revealed by fNIRS hyperscanning** *SCIENTIFIC REPORTS*
 Baker, J. M., Liu, N., Cui, X., Vrticka, P., Saggar, M., Hosseini, S. M., Reiss, A. L.
 2016; 6
- **Surface-based morphometry reveals distinct cortical thickness and surface area profiles in Williams syndrome** *AMERICAN JOURNAL OF MEDICAL GENETICS PART B-NEUROPSYCHIATRIC GENETICS*
 Green, T., Fierro, K. C., Raman, M. M., Saggar, M., Sheau, K. E., Reiss, A. L.
 2016; 171 (3): 402-413
- **Understanding the influence of personality on dynamic social gesture processing: An fMRI study.** *Neuropsychologia*
 Saggar, M., Vrticka, P., Reiss, A. L.
 2016; 80: 71-78
- **Estimating individual contribution from group-based structural correlation networks.** *NeuroImage*
 Saggar, M., Hosseini, S. M., Bruno, J. L., Quintin, E., Raman, M. M., Kesler, S. R., Reiss, A. L.
 2015; 120: 274-284
- **Neural Correlates of Self-Injurious Behavior in Prader-Willi Syndrome** *HUMAN BRAIN MAPPING*
 Klabunde, M., Saggar, M., Hustyi, K. M., Hammond, J. L., Reiss, A. L., Hall, S. S.
 2015; 36 (10): 4135-4143
- **Examining the neural correlates of emergent equivalence relations in fragile X syndrome** *PSYCHIATRY RESEARCH-NEUROIMAGING*
 Klabunde, M., Saggar, M., Hustyi, K. M., Kelley, R. G., Reiss, A. L., Hall, S. S.
 2015; 233 (3): 373-379
- **Mean-field thalamocortical modeling of longitudinal EEG acquired during intensive meditation training** *NEUROIMAGE*
 Saggar, M., Zanesco, A. P., King, B. G., Bridwell, D. A., MacLean, K. A., Aichele, S. R., Jacobs, T. L., Wallace, B. A., Saron, C. D., Miiikkulainen, R.
 2015; 114: 88-104
- **Pictionary-based fMRI paradigm to study the neural correlates of spontaneous improvisation and figural creativity** *SCIENTIFIC REPORTS*
 Saggar, M., Quintin, E., Kienitz, E., Bott, N. T., Sun, Z., Hong, W., Chien, Y., Liu, N., Dougherty, R. F., Royalty, A., Hawthorne, G., Reiss, A. L.
 2015; 5
- **Early signs of anomalous neural functional connectivity in healthy offspring of parents with bipolar disorder** *BIPOLAR DISORDERS*
 Singh, M. K., Chang, K. D., Kelley, R. G., Saggar, M., Reiss, A. L., Gotlib, I. H.
 2014; 16 (7): 678-689
- **Revealing the neural networks associated with processing of natural social interaction and the related effects of actor-orientation and face-visibility** *NEUROIMAGE*
 Saggar, M., Shelly, E. W., Lepage, J., Hoeft, F., Reiss, A. L.
 2014; 84: 648-656
- **Creativity training enhances goal-directed attention and information processing** *THINKING SKILLS AND CREATIVITY*
 Bott, N., Quintin, E., Saggar, M., Kienitz, E., Royalty, A., Hong, D. W., Liu, N., Chien, Y., Hawthorne, G., Reiss, A. L.
 2014; 13: 120-128
- **Targeted intervention to increase creative capacity and performance: A randomized controlled pilot study** *THINKING SKILLS AND CREATIVITY*
 Kienitz, E., Quintin, E., Saggar, M., Bott, N. T., Royalty, A., Hong, D. W., Liu, N., Chien, Y., Hawthorne, G., Reiss, A. L.
 2014; 13: 57-66

- **Intensive training induces longitudinal changes in meditation state-related EEG oscillatory activity** *FRONTIERS IN HUMAN NEUROSCIENCE*
Saggar, M., King, B. G., Zanesco, A. P., MacLean, K. A., Aichele, S. R., Jacobs, T. L., Bridwell, D. A., Shaver, P. R., Rosenberg, E. L., Sahdra, B. K., Ferrer, E., Tang, A. C., Mangun, et al
2012; 6
- **Behavioral, neuroimaging, and computational evidence for perceptual caching in repetition priming** *BRAIN RESEARCH*
Saggar, M., Miikkulainen, R., Schnyer, D. M.
2010; 1315: 75-91
- **Memory Processes in Perceptual Decision Making** *Proceedings of the 30th Annual Conference of the Cognitive Science Society, Nashville, TN*
Saggar M., Miikkulainen R., Schnyer D. M.
2008
- **A computational model of the motivation-learning interface** *Proceedings of the 29th Annual Conference of the Cognitive Science Society, Nashville, TN*
Saggar M., Markman A.B., Maddox W.T., Miikkulainen R.
2007
- **Autonomous learning of stable quadruped locomotion** *ROBOCUP 2006: ROBOT SOCCER WORLD CUP X*
Saggar, M., D'Silva, T., Kohl, N., Stone, P.
2007; 4434: 98-109
- **System identification for the Hodgkin-Huxley model using artificial neural networks** *2007 IEEE INTERNATIONAL JOINT CONFERENCE ON NEURAL NETWORKS, VOLS 1-6*
Saggar, M., Mericli, T., Andoni, S., Miikkulainen, R.
2007: 2239-2244
- **Optimization of association rule mining using improved genetic algorithms** *IEEE International Conference on Systems, Man and Cybernetics*
Saggar M, Agrawal, A.K. , Lad, A.
2004; 4434/2007: 3725 - 3729