KAUSTUBH R. KULKARNI

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Education

2025 – Present
New Haven, CT
Residency Physician, Neuroscience Research Training Program (NRTP)
Department of Psychiatry, Yale University School of Medicine

2017 – 2025
New York, NY
MD, PhD, Medical Scientist Training Program (MSTP)
Department of Psychiatry, Icahn School of Medicine at Mount Sinai
Dissertation Title: "A Computational Psychiatry Approach Towards Momentary Craving" awarded 2023.

2011 – 2015
New Brunswick, NJ
Bachelor of Arts (Honors), Cell Biology and Neuroscience
Minors in Computer Science and Philosophy
Rutgers University, New Brunswick

Research Experience

2017 – 2023
New York, NY
Graduate Student, Center for Computational Psychiatry
Department of Psychiatry, Icahn School of Medicine at Mount Sinai
Advisors:
- Xiaosi Gu, Ph.D. – Director of Center for Computational Psychiatry
- Daniela Schiller, Ph.D**.** – Professor of Psychiatry and Neuroscience

2022
London, UK
Internship – Computational Psychiatry
Computational Psychiatry Group, Alena
Advisors:
- Quentin Huys, M.D., Ph.D. – Professor in Computational Psychiatry, UCL
- Mona Garvert, Ph.D. – External Researcher, Max Planck Institute

2015 – 2017
New York, NY
Lab Manager/Research Assistant – Center for Molecular and Behavioral Neuroscience (CMBN)
Department of Neuroscience, Rutgers University – Newark
Advisors:
- Michael W. Cole, Ph.D. – Associate Professor of Neuroscience

2011 – 2015
New York, NY
Research Assistant – Center for Advanced Biotechnology and Medicine (CABM)
Department of Chemistry, Rutgers University – New Brunswick
Advisors:
- Gaetano Montelione, Ph.D. – Professor of Chemistry and Chemical Biology

Teaching Experience

2021 – 2023 New York, NY	**Director, Summer Program in Computational Psychiatry Education (SPICE)** Department of Psychiatry, Icahn School of Medicine at Mount Sinai
2022 New York, NY	**Teaching Assistant, Fundamentals of Computational Psychiatry** Department of Psychiatry, Icahn School of Medicine at Mount Sinai
2020 – 2022 New York, NY	**Teaching Assistant, Brain and Behavior (MD Program)** Icahn School of Medicine at Mount Sinai
2014 – 2015 New Brunswick, NJ	**Teaching Assistant, Chemistry and Organic Chemistry** Department of Chemistry, Rutgers University – New Brunswick
2013 – 2014 New Brunswick, NJ	**Lecturer, Introduction to Sciences for First Years** Department of Education, Rutgers University – New Brunswick
2012 – 2015 New Brunswick, NJ	**Supplemental Instructor, Organic Chemistry and Physics** ODASIS, Rutgers University – New Brunswick

Clinical Experience

2017 – 2025 New York, NY	**MD Program** Icahn School of Medicine at Mount Sinai
2015 – 2017 Princeton, NJ	**Emergency Medical Technician (EMT)** Princeton First Aid and Rescue Squad

Skills

Programming	Proficient in Python, Matlab, R, Javascript, shell scripting Relevant data analysis libraries: scikit-learn, tensorflow, brainiak, tidyverse Bayesian statistical modeling: Stan, pymc
Applications	Relevant data analysis methods: reinforcement learning, general linear modeling, multivariate pattern analysis, network analysis, hyperalignment, custom interpretable machine learning algorithms Proficient in use of neuroimaging software: nilearn, SPM, fmriprep, AFNI, freesurfer
Platforms	Basic experience with full-stack web development Deployed a small personal application using Flask backend, React frontend, and AWS for hosting
Relevant graduate coursework	Drug Addiction: Mechanisms and Therapeutic Approaches – 2022 Addiction Seminar – 2022 Statistical Rethinking, A Bayesian Course – 2021 Probability and Inference – 2021 Machine Learning for Biomedical Data Science – 2020 Biomedical Software Engineering – 2020

Publications

Ding, J.E., Yang, S., Zilverstand, A., **Kulkarni, K.R.**, Gu, X. and Liu, F., 2024. Spatial Craving Patterns in Marijuana Users: Insights from fMRI Brain Connectivity Analysis with High-Order Graph Attention Neural Networks. *IEEE Journal of Biomedical and Health Informatics*.

Perl, O., Duek, O., **Kulkarni, K.R.**, Gordon, C., Krystal, J.H., Levy, I., Harpaz-Rotem, I. and Schiller, D., 2023. Neural patterns differentiate traumatic from sad autobiographical memories in PTSD. *Nature neuroscience*, *26*(12), pp.2226-2236.

Kulkarni, K.R., O'Brien, M. and Gu, X., 2023. Longing to act: Bayesian inference as a framework for craving in behavioral addiction. *Addictive Behaviors*, p.107752.

Kulkarni, K.R., Schafer, M., Berner, L.A., Fiore, V.G., Heflin, M., Hutchison, K., Calhoun, V., Filbey, F., Pandey, G., Schiller, D. and Gu, X., 2023. An interpretable and predictive connectivity-based neural signature for chronic cannabis use. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, *8*(3), pp.320-330.

Shuster, A., O'Brien, M., Luo, Y., Berner, L.A., Perl, O., Heflin, M., **Kulkarni, K.,** Chung, D., Na, S., Fiore, V.G. and Gu, X., 2021. Emotional adaptation during a crisis: decline in anxiety and depression after the initial weeks of COVID-19 in the United States. *Translational psychiatry*, *11*(1), pp.1-7.

Fiore, V.G., DeFelice, N., Glicksberg, B.S., Perl, O., Shuster, A., **Kulkarni, K.,** O'Brien, M., Pisauro, M.A., Chung, D. and Gu, X., 2021. Containment of COVID-19: Simulating the impact of different policies and testing capacities for contact tracing, testing, and isolation. *PloS one*, *16*(3), p.e0247614.

Spronk, M., Keane, B.P., Ito, T., **Kulkarni, K.,** Ji, J.L., Anticevic, A. and Cole, M.W., 2021. A whole-brain and cross-diagnostic perspective on functional brain network dysfunction. *Cerebral Cortex*, *31*(1), pp.547-561.

Luo, Y., Shuster, A., Chung, D., O'Brien, M., Heflin, M., Fiore, V., **Kulkarni, K.,** Na, S. and Gu, X., 2020, July. Dissociable social perception and altruistic choices during the first wave of COVID-19 in the United States. University of the Bundeswehr.

Ji, J.L., Spronk, M., **Kulkarni, K.,** Repovš, G., Anticevic, A. and Cole, M.W., 2019. Mapping the human brain's cortical-subcortical functional network organization. *Neuroimage*, *185*, pp.35-57.

Chen, R.H., Ito, T., **Kulkarni, K.R.** and Cole, M.W., 2018. The human brain traverses a common activation-pattern state space across task and rest. *Brain Connectivity*, *8*(7), pp.429-443.

Ito, T., **Kulkarni, K.R.,** Schultz, D.H., Mill, R.D., Chen, R.H., Solomyak, L.I. and Cole, M.W., 2017. Cognitive task information is transferred between brain regions via resting-state network topology. *Nature communications*, *8*(1), pp.1-14.

Preprints

Imtiaz, Z., Kato, A., Kopell, B.H., Qasim, S.E., Davis, A.N., Martinez, L.N., Heflin, M., **Kulkarni, K.R.**, Morsi, A., Gu, X. and Saez, I., 2024. Human Substantia Nigra Neurons Encode Reward Expectations. *bioRxiv*, pp.2024-05.

Kulkarni, K. R., Berner, L. A., Schiller, D., Fiore, V. G., & Gu, X., 2023. A generalizable computational mechanism underlying the interaction between momentary craving and decision-making. *bioRxiv*, 2023-04. (*under review at Nature Mental Health*)

Honors and Awards

2024	Distinction in Research, Mount Sinai
2022	T32 Training Program in Substance Use Disorders, Mount Sinai
2015	Departmental Highest Honors, Neuroscience, Rutgers University
2015	Bachelor of Arts Magna Cum Laude, Rutgers University
2014	Phi Beta Kappa Honors Society, Rutgers University
2012	CABM Undergraduate Program Scholar, Rutgers University
2011	Presidential Scholarship (Full Tuition), Rutgers University
2011	National Merit Scholarship, National Merit Scholarship Corporation

Presentations

2025 New York, NY	**Invited Talk.** "*A Computational Psychiatry Approach Towards Momentary Craving.*" Department of Neuroscience, Icahn School of Medicine at Mount Sinai
2025 Philadelphia, PA	**Invited Talk.** "*Neural and Computational Signatures of Craving.*" Department of Neuroscience, University of Pennsylvania
2022 New York, NY	**Data Blitz**. "*Computational Mechanisms Underlying Multi-Domain Decision Making and Momentary Craving*." Neuroscience Department Retreat, Icahn School of Medicine at Mount Sinai
2022 London, UK	**Invited Talk.** "*Computational Mechanisms of Craving and Addictive Decision-making.*" Computational Psychiatry Research Group, Alena

Workshops

2022	Computational Psychiatry Course – Zurich
2021	Neuromatch Academy – Computational Neuroscience
2019 New York, NY	Computational Psychiatry Course, Bayesian Learning and Reinforcement Learning Workshop
2019 Princeton, NJ	Brainiak Inter-subject Correlation (ISC) and Shared Response Modeling (SRM) Workshop, Hasson Lab