SATRAJIT SUJIT GHOSH

Curriculum Vitae

McGovern Institute for Brain Research
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Department of Otolaryngology – Head and Neck Surgery
Massachusetts Eye and Ear
243 Charles Street Boston, MA 02114

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Degrees

PhD, Cognitive and Neural Systems, Boston University, 2005, Prof. Frank Guenther
B.S. (Honors), Computer Science, National University of Singapore, 1997, Prof. Lonce L. Wyse

Employment

Director of the Open Data in Neuroscience Initiative, McGovern Institute for Brain Research, MIT, 2023 – Current
Principal Research Scientist, McGovern Institute for Brain Research, MIT, 2015 – Current
Assistant Professor, Department of Otolaryngology, Harvard Medical School, 2014 – Current
Research Scientist, McGovern Institute for Brain Research, MIT, 2011 – 2014
Research Scientist, Research Laboratory of Electronics, MIT, 2007 – 2011
Postdoctoral Associate, Research Laboratory of Electronics, MIT, 2004 – 2007, Dr. Joseph S. Perkell
Software Engineer, Kent Ridge Digital Labs, Singapore, 1997-1998

External Positions held

Massachusetts Eye and Ear, Harvard Medical School, 2014 – Current, Research Associate
Speech and Hearing Biosciences and Technology, (now in) Division of Medical Sciences, Harvard Medical School, 2008 – Current, Member of the Faculty
Program in Neuroscience, Division of Medical Sciences, Harvard Medical School, 2019 – Current, Member of the Faculty
Standards for Datasharing Taskforce, International Neuroinformatics Coordinating Facilities, 2010 – 2016
Executive board, TankThink Labs, LLC, 2011 – 2015
Department of Cognitive and Neural Systems, Boston University, 2005-2010, Research Fellow

Honors

Winner - Predictive Analytics Competition for Depression, University of Muenster, 2018
Phase I winner for the Open Science Prize competition, NIH, HHMI, Wellcome Trust, 2016
Educational stipend, International Society for Magnetic Resonance in Medicine, 2008
Graduate Teaching Fellow Award, Boston University, 2000
Presidential University Graduate Fellowship, Boston University, 1998

UROP Students supervised

Alkhairy, Samiya, Fall, 2009, Spring 2010
Zhang, Mark, Spring 2012
Ung, William, Spring 2012
Smith, Ashley, Spring 2015

Biswas, Jyotishka, Spring 2016
Suh, Michelle, Spring 2016
Taylor, Tilly, Spring 2016
Jackson, Blake, Spring 2016
Batmunkh, Zulsar, Spring 2016
Wu, David, Fall 2016
Wu, Kathy, Spring 2017
Shumaev, Alexander, Fall 2018
Moreno, Felipe, Fall 2018
Megha Vemuri, Fall, Spring, Summer 2022
Nicholas F Gustafson, Fall, 2022
Sabeen Lohawala, Spring, 2023

MEng/MSc Thesis Supervised
Alice Bizeul, EPFL, 2020
Gasser Elbanna, EPFL, 2023
Agathe Tournant, ETH, 2024
Sabeen Lohawala, MIT, 2024

Ph.D. Students Supervised
Ciccarelli, Gregory, Characterization of Phone Rate as a Vocal Biomarker of Depression, 2017 (Current: Amazon, Inc.)
Sitek, Kevin, Investigating the human subcortical auditory pathway with MRI, 2019 (Current: Research Assistant Professor, Northwestern University)
Low, Daniel, Speech and text psychometrics: Identifying suicide risk factors with large language models and acoustic networks, 2024 (Current: Postdoctoral Fellow, Harvard University)
Mentch, Jefffrey, SHBT PhD student, Harvard Medical School, In progress
Burdinski, Debbie, MD/PhD student, Harvard Medical School, In progress
Rahul Brito, SHBT PhD student, Harvard Medical School, In progress

Postdoctoral Researchers Supervised
Ghosh, Debanjan, 2018 – 2019 (Current: Educational Testing Service, Princeton, NJ)
Padhy, Smruti, 2016 – 2018 (Current: Research Associate, Texas Advanced Supercomputing Center, TX)
Jarecka, Dorota, 2016 – 2017 (Current: Research scientist, MIT)
Rajaei, Hoda, 2019 – 2022 (Current: Machine Learning Scientist, Beyond Limits, CA)
Kleinberger, Rebecca, 2020 – 2021 (Current: Assistant Professor, Northeastern University)
Rana, Aakanksha, 2020 – 2022 (Current: Senior Scientist, Imaging AI, Johnson & Johnson)
Das, Dhritiman, 2020 - 2022
Catania, Fabio, 2022 -
King, Maedbh, 2022 -
Chan, Yibei, 2023 –
Chhetri, Tek Raj, 2024 -

Teaching experience
6.541/SHBT.204, Speech Communication, Spring 2009, 2011- 2016
6.551/SHBT.200, Acoustics of Speech and Hearing, Fall 2007- 2015
9.S912, Quantitative Methods and Computational Models in Neuroscience, Fall 2015
HST.583, fMRI Data Acquisition and Analysis, Fall 2015, 2017, 2019

HST.714/SHBT.200/9.016, Introduction to Sound, Speech, and Hearing, Fall 2016 – Fall 2022
SHBT.205, Speech and Hearing: From Neuroscience to Perception, Spring 2024 -

Service

Internal service:
Committee on Research Computing and Data, Office of Research Computing and Data, MIT, 2022 - Current
Admissions committee, Speech and Hearing Biosciences and Technology Program (HST), 2010 – Current
Curriculum committee, Speech and Hearing Biosciences and Technology Program (HST), 2009 – Current
Director, Openmind Neuroscience High Performance Computing Resource, 2014 - 2023
Chair, BCS Faculty Committee on Computational Infrastructure, 2019 - 2022

External service:

Scientific Advisory Board
- INCF, Council for Training, Science and Infrastructure (CTSI), Chair, 2024 -
- NIH Healthy Brain and Child Development Study (https://hbcdstudy.org), 2021 -
- OpenScope Project Allen Institute for Brain Science (https://openscope.ai), 2021-
- NWB – Neurodata Without Borders (https://nwb.org), 2020 -
- CONP – Canadian Open Neuroscience Platform (https://conp.ca), 2018 - 2019
- SINDS – Neurohackademy Training Program (https://neurohackademy.org), 2017 - 2022

Editorial board
- Aperture Neuro, Handling editor, 2020 -
- Frontiers in Brain Imaging Methods, 2012 – 2022
- Frontiers in Neuroinformatics, 2016 – 2022
- Frontiers in Human Neuroscience, 2015 – 2017

Member
- NIH Study Section, Neurological, Mental and Behavioral Health (NMBH), Standing Member, 2023 –
- Organization for Human Brain Mapping (OHBM) - Best Practices Committee, 2020 - 2024
- Alzheimer's Drug Discovery Foundation - Diagnostics Accelerator Speech Consortium, 2020

Ad hoc grant reviewer
- EU Horizon (2023)
- National Institute of Health, 2017 – 2022 (NOIT, BRAIN Initiative, EITN)
- National Science Foundation, 2008, 2010, 2013
- National Medical Research Council, Singapore, 2007, 2009, 2011-2012
- Department of Defense, 2011
- Simons Foundation, 201
- Israel Science Foundation, 2015, 2019

Ad hoc editorial reviewer
- Biological Psychiatry
- Brain
- Brain and Language
- Brain Structure and Function
- Cerebral Cortex
- Current Biology
- Elife

European Journal of Neuroscience
Frontiers in Computational Neuroscience
Frontiers in Systems Neuroscience
Frontiers in Neuroinformatics
Human Brain Mapping
Journal of the Acoustical Society of America
Journal of Machine Language Research
Journal of Neuroscience
Journal of Speech, Language and Hearing Research
Magnetic Resonance in Medicine
Nature Methods
Nature Translational Psychiatry
NeuroImage
Neuroinformatics
Neuron
PLOS One
PLOS Computational Biology

Editorial board, Special Research Topic, Python in Neuroscience I / II, Frontiers in Neuroscience
Nipype teaching workshops, Edinburgh 2011, Magdeburg 2012, Boston 2017
Speaker, Educational workshop, Organization for Human Brain Mapping, 2013, 2018
Organizer, HBM Hackathon, Organization for Human Brain Mapping, Seattle, 2013
Local organizing committee, 4th Biennial Conference on Resting State Connectivity, Boston, 2014

Technological and Other Scientific Innovations

DANDI	https://dandiarchive.org An opensource infrastructure as a service supported by the US NIH BRAIN Initiative to house and disseminate neurophysiology data. https://github.com/dandi
Methods and Apparatus for Reducing Stuttering	US Patent No.: 11727949 – Issued August 2023 This is based on dissertation work of former postdoctoral associate Rebecca Kleinberger. It involves an apparatus and a software to enable realtime vocal modification as an assistive technology for individuals who stutter.
Assessing Disorders Through Speech And A Computational Model	U.S. Patent No.: 10127929 – Issued November 2018 1. Williamson JR, Quatieri TF, Helfer BS, Perricone J, **Ghosh SS**, ** Ciccarelli G, Mehta DD. (2015) Segment-dependent dynamics in predicting Parkinson's disease. In Sixteenth Annual Conference of the International Speech Communication Association. 2. ** Ciccarelli G, Quatieri TF, **Ghosh SS** (2016) Neurophysiological Vocal Source Modeling for Biomarkers of Disease. In Seventeenth Annual Conference of the International Speech Communication Association. (** Mr. Ciccarelli, an MIT EECS graduate student is a current mentee). The goal of this effort is to supplement the VoiceUp platform with augmented algorithms for tracking mental health state using computational models. The model itself is based on my doctoral thesis work and I guided the team to using that

framework. This came out of the MIT MINT funded collaboration with MIT Lincoln Laboratory.

Nipype: Brain imaging analysis framework
2008-

Gorgolewski K, Burns CD, Madison C, Clark D, Halchenko YO, Waskom ML, Ghosh SS. (2011). Nipype: a flexible, lightweight and extensible neuroimaging data processing framework in Python. Front. Neuroimform. 5:13.
https://github.com/nipy/nipype

Nipype provides an open source Python library for constructing scalable, reusable, and efficient dataflows for biomedical research. Nipype provides a standard Python interface to 750+ tools and algorithms from more than 25 neuroimaging software packages written in C++, MATLAB, Java, and Python. Nipype dataflows can be executed in various HPC (high-performance computing), commercial Cloud, and local environments. Nipype forms a base software layer for some of the most popular neuroimaging workflows in use today (fMRIPrep, Mindboggle, C-PAC and others).

Over 190+ individuals have contributed to the code base and the software is used in 88 countries.

MURFI: a realtime MR biofeedback software
2007

Hinds, O., **Ghosh, S**., Thompson, T.W., Yoo, J.J., Whitfield-Gabrieli, S., Triantafyllou, C., Gabrieli, J.D. (2011) Computing moment-to-moment BOLD activation for real-time neurofeedback. Neuroimage. 54(1):361-8. PMID: 20682350.
https://github.com/gablab/murfi2/
This opensource software framework allows biofeedback of activation based on the BOLD signal. I created the testing and validation framework for the software and contributed to its design and implementation. We are now using this software for ongoing projects in the treatment of schizophrenia and in the development of new paradigms. Development of this was supported by the McGovern Institute MINT program.

This is now in use in two clinical trials at Northeastern University and at University of Minnesota, Minneapolis.

Realtime vocal modification software
2005

Cai, S., **Ghosh, S.**, Guenther, F., Perkell, J. (2011). Focal manipulations of formant trajectories reveal a role of auditory feedback in the online control of both within-syllable and between-syllable speech timing. J Neurosci 31: 45. 16483-16490. PMID: 22072698.
https://github.com/shanqing-cai/audapter_matlab
https://github.com/shanqing-cai/audapter_mex
This opensource framework allows modifying vocal characteristics in realtime. I established the initial framework and guided Marc Boucek and Shanqing Cai in extending the framework to perform new paradigms.

Noise suppression for MRI patient
2007

Two provisional patents were applied for but not pursued after expiry.
Online noise suppression software for Magnetic Resonance Imaging

microphone input 2004	2007 Bidirectional noise suppressing communication setup for Magnetic Resonance Imaging https://arxiv.org/abs/1207.5827 The goal of this software was to provide a mechanism to suppress MR noise. This is still being used in research projects at MIT.
Carotid artery diameter estimation from ultrasound images 1999	Current usage status is unknown. I built the graphical interface for the software to provide a semi-automated method for artery diameter estimation that reduced human intervention significantly and validated it against manual measurements.
FlexEffex: Interactive sound effects and music 1997	I contributed to the development of the FlexEffex architecture and rewrote the internal sound effects plugin api and hardware libraries. The software was subsequently sold to a company, MindMaker Inc.

Publications

1. Guenther, F.H., Nieto-Castanon, A., Tourville, J.A. and **Ghosh, S.S.** (2001) The effects of categorization training on auditory perception and cortical representations. Proceedings of the Speech Recognition as Pattern Classification (SPRAAC) Workshop, Nijmegen, The Netherlands.
2. Guenther, F.H. and **Ghosh, S.S.** (2003) A model of cortical and cerebellar function in speech. Proceedings of the XVth International Congress of Phonetic Sciences (pp. 169-173). Barcelona, Spain: 15th ICPhS Organizing Committee.
3. Guenther, F.H., **Ghosh, S.S.** and Nieto-Castanon, A. (2003) A neural model of speech production. Proceedings of the 6th International Seminar on Speech Production. Sydney, Australia
4. Nieto-Castanon, A., **Ghosh, S.S.**, Tourville, J.A., Guenther, F.H. (2003) Region of interest based analysis of functional imaging data. Neuroimage. 19(4):1303-16. PMID: 12948689.
5. Guenther, F.H., Nieto-Castanon, A., Ghosh, S.S., Tourville, J.A. (2004) Representation of sound categories in auditory cortical maps. J Speech Lang Hear Res. 47(1):46-57. PMID: 15072527.
6. Max, L., Guenther, F.H., Gracco, V.L., **Ghosh, S.S.** and Wallace, M.E. (2004) Unstable or insufficiently activated internal models and feedback-biased motor control as sources of dysfluency: A theoretical model of stuttering. Contemporary Issues in Communication Science and Disorders. 31.
7. Klein, A., Mensh, B., **Ghosh, S.**, Tourville, J., Hirsch, J. (2005) Mindboggle: automated brain labeling with multiple atlases. BMC Med Imaging. 5:7. PMCID: PMC1283974.
8. Guenther, F.H., **Ghosh, S.S.**, Tourville, J.A. (2006) Neural modeling and imaging of the cortical interactions underlying syllable production. Brain Lang. 96(3):280-301. PMCID: PMC1473986.
9. Guenther, F.H., **Ghosh, S.S.**, Nieto-Castanon, A. and Tourville, J.A. (2006) A neural model of speech production. In: J. Harrington & M. Tabain (eds.), Speech Production: Models, Phonetic Processes, and Techniques. London: Psychology Press.
10. Tiede, M., Shattuck-Hufnagel, S., Johnson, B., **Ghosh, S.**, Matthies, M., Zandipour, M. and Perkell, J. (2007) Gestural phasing in /kt/ sequences contrasting within and cross word contexts. Proceedings of the XVIth International Congress of Phonetic Sciences. Saarbrücken, Germany.
11. **Ghosh, S.S.**, Tourville, J.A., Guenther, F.H. (2008) A neuroimaging study of premotor lateralization and cerebellar involvement in the production of phonemes and syllables. J Speech Lang Hear Res. 51(5):1183-202. PMCID: PMC2652040.

12. Cai, S, Boucek, M, **Ghosh, S.S.**, Guenther, F.H., Perkell, J.S. (2008) A System for Online Dynamic Perturbation of Formant Trajectories and Results from Perturbations of the Mandarin Triphthong /iau/. International Seminar in Speech Production, Strassbourg, France.
13. Balci, S.K., Sabuncu, M.R., Yoo, J., **Ghosh, S.S.**, Whitfield-Gabrieli, S., Gabrieli, J.D., Golland, P. (2008) Prediction of Successful Memory Encoding from fMRI Data. Med Image Comput Comput Assist Interv. 2008(11):97-104. PMCID: PMC2855196.
14. Perkell, J.S., Lane, H., **Ghosh, S.S.**, Matthies, M.L., Tiede, M., Guenther, F., Ménard, L. (2008) Mechanisms of Vowel Production: Auditory Goals and Speaker Acuity. International Seminar in Speech Production, Strassbourg, France.
15. Klein, A., **Ghosh, S.S.**, Avants, B., Yeo, B.T., Fischl, B., Ardekani, B., Gee, J.C., Mann, J.J., Parsey, R.V. (2010) Evaluation of volume-based and surface-based brain image registration methods. Neuroimage. 51(1):214-20. PMCID: PMC2862732.
16. Cai, S., **Ghosh, S.S.**, Guenther, F.H., Perkell, J.S. (2010) Adaptive auditory feedback control of the production of formant trajectories in the Mandarin triphthong /iau/ and its pattern of generalization. J Acoust Soc Am. 128(4):2033-48. PMCID: PMC2981117.
17. **Ghosh, S.S.**, Kakunoori, S., Augustinack, J., Nieto-Castanon, A., Kovelman, I., Gaab, N., Christodoulou, J.A., Triantafyllou, C., Gabrieli, J.D., Fischl, B. (2010) Evaluating the validity of volume-based and surface-based brain image registration for developmental cognitive neuroscience studies in children 4 to 11 years of age. Neuroimage. 53(1):85-93. PMCID: PMC2914629.
18. **Ghosh, S.S.**, Matthies, M.L., Maas, E., Hanson, A., Tiede, M., Ménard, L., Guenther, F.H., Lane, H., Perkell, J.S. (2010) An investigation of the relation between sibilant production and somatosensory and auditory acuity. J Acoust Soc Am. 128(5):3079-87. PMCID: PMC3003728.
19. Golfinopoulos, E., Tourville, J.A., Bohland, J.W., **Ghosh, S.S.**, Nieto-Castanon, A., Guenther, F.H. (2011) fMRI investigation of unexpected somatosensory feedback perturbation during speech. Neuroimage. 55(3):1324-38. PMCID: PMC3065208
20. Silver, A.L., Nimkin, K., Ashland, J.E., **Ghosh, S.S.**, Van der Kouwe, A.J., Brigger, M.T., Hartnick, C.J. (2011) Cine magnetic resonance imaging with simultaneous audio to evaluate pediatric velopharyngeal insufficiency. Arch Otolaryngol Head Neck Surg. 137(3):258-63.
21. Brunner, J., **Ghosh, S.**, Hoole, P., Matthies, M., Tiede, M., Perkell, J. (2011) The influence of auditory acuity on acoustic variability and the use of motor equivalence during adaptation to a perturbation. J Speech Lang Hear Res. 54(3):727-39. PMID: 20966388.
22. Cai, S., **Ghosh, S.**, Guenther, F., Perkell, J. (2011). Focal manipulations of formant trajectories reveal a role of auditory feedback in the online control of both within-syllable and between-syllable speech timing. J Neurosci 31: 45. 16483-16490. PMID: 22072698.
23. Hinds, O., **Ghosh, S.**, Thompson, T.W., Yoo, J.J., Whitfield-Gabrieli, S., Triantafyllou, C., Gabrieli, J.D. (2011) Computing moment-to-moment BOLD activation for real-time neurofeedback. Neuroimage. 54(1):361-8. PMID: 20682350.
24. Gorgolewski, K., Burns, C.D., Madison, C., Clark, D., Halchenko, Y.O., Waskom, M.L., **Ghosh, S.S.** (2011). Nipype: a flexible, lightweight and extensible neuroimaging data processing framework in Python. *Front. Neuroinform.* **5**:13.
25. Perrachione, T.K., Del Tufo, S.N., **Ghosh, S.S.**, Gabrieli, J.D.E. (2011) "Phonetic variability in speech perception and the phonological deficit in dyslexia." 17th Meeting of the International Congress of Phonetic Sciences, (Hong Kong, August 2011).
26. Poline, J., Breeze, J.L., **Ghosh, S.S.**, Gorgolewski, K., Halchenko, Y.O., Hanke, M., Haslegrove, C., Helmer, K.G., Marcus, D.S., Poldrack, R.A., Schwartz, Y., Ashburner, J. and Kennedy, D.N. (2012). Data sharing in neuroimaging research. *Front. Neuroinform.* **6:**9.
27. **Ghosh, S.S.**, Klein, A., Avants, B. and Millman, K.J. (2012). Learning from open source software projects to improve scientific review. *Front. Comput. Neurosci.* **6:**18

28. Cai, S., Beal, D.S., **Ghosh, S.S**., Tiede, M.K., Guenther, F.H., Perkell, J.S. (2012) Weak responses to auditory feedback perturbation during articulation in persons who stutter: Evidence for abnormal auditory-motor transformation. PLoS One.
29. ***** Doehrmann, O., ***** **Ghosh, S.S**., Polli, F.P., Reynolds, G., Horn, F., Keshavan, A., Whitfield-Gabrieli, S., Hofmann, S.G., Pollack, M., Gabrieli, J.D. (2013) Predicting treatment response in social anxiety disorder from functional magnetic resonance imaging. JAMA Psychiatry. (***** Joint first authors)
30. Hinds, O., Thompson, T., **Ghosh, S.S.**, Yoo, J., Whitfield-Gabrieli, S., Triantafyllou, C., Gabrieli, J. (2013) Roles of Default-Mode Network and Supplementary Motor Area in Human Vigilance Performance: Evidence from Real-Time fMRI. Journal of Neurophysiology.
31. Tustison NJ, Johnson HJ, Rohlfing T, Klein A, **Ghosh SS**, Ibanez L and Avants B (2013). Instrumentation bias in the use and evaluation of scientific software: Recommendations for reproducible practices in the computational sciences. Front. Neurosci. 7:162.
32. **Ghosh, S.S.**, Keshavan, A., Langs, G (2013). Predicting Treatment Response from Resting State fMRI Data: Comparison of Parcellation Approaches. 3rd International Workshop on Pattern Recognition in NeuroImaging (Philadelphia, June 2013).
33. Perrachione, T.K. and **Ghosh, S.S.** (2013). Optimized design and analysis of sparse-sampling fMRI experiments. Front. Neurosci. 7:55. doi: 10.3389/fnins.2013.00055
34. Cai, S., Beal, D.S., **Ghosh, S.S.**, Guenther, F.H., Perkell, J.S. (2014) Impaired timing adjustments in response to time-varying auditory perturbation during connected speech production in persons who stutter. Brain and Language.
35. Cai, S., Tourville, J.A., Beal, D.S., Perkell, J.S., Guenther, F.H. and **Ghosh, S.S.** (2014). Diffusion Imaging of Cerebral White Matter in Persons Who Stutter: Evidence for Network-Level Anomalies. Front. Hum. Neurosci. 8:54
36. Christodoulou JA, Del Tufo SN, Lymberis J, Saxler PK, **Ghosh SS**, Triantafyllou C, Whitfield-Gabrieli S, Gabrieli JD. (2014). Brain bases of reading fluency in typical reading and impaired fluency in dyslexia. PLoS One. 9(7):e100552. doi: 10.1371/journal.pone.0100552. eCollection 2014.
37. Stoeckel, L.E., Garrison, K.A., **Ghosh, S.S.**, Wighton, P., Hanlon, C.A., Gilman, J.M., Greer, S., Turk-Browne, N.B., deBettencourt, M.T., Scheinost, D., Craddock, C., Thompson, T., Calderon, V., Bauer, C.C., George, M., Breiter, H.C., Whitfield-Gabrieli, S., Gabrieli, J.D., LaConte, S.M., Hirshberg, L., Brewer, J.A., Hampson, M., Van Der Kouwe, A., Mackey, S., Evins, A.E. (2014). Optimizing real time fMRI neurofeedback for therapeutic discovery and development, NeuroImage: Clinical
38. Gabrieli, J.D.E., **Ghosh, S.S.**, Whitfield-Gabrieli, S. (2015). Prediction as a Humanitarian and Pragmatic Contribution from Human Cognitive Neuroscience. Neuron.
39. Gorgolewski KJ, Varoquaux G, Rivera G, Schwartz Y, Sochat VV, **Ghosh SS**, Maumet C, Nichols TE, Poline JB, Yarkoni T, Margulies DS, Poldrack RA (2015). NeuroVault.org: A repository for sharing unthresholded statistical maps, parcellations, and atlases of the human brain. Neuroimage.
40. Gorgolewski KJ, Varoquaux G, Rivera G, Schwarz Y, **Ghosh SS**, Maumet C, Sochat VV, Nichols TE, Poldrack RA, Poline JB, Yarkoni T, Margulies DS. (2015). NeuroVault.org: a web-based repository for collecting and sharing unthresholded statistical maps of the human brain. Front Neuroinform. 10;9:8.
41. Langs G, Golland P, **Ghosh SS.** (2015) Predicting Activation Across Individuals with Resting-State Functional Connectivity Based Multi-Atlas Label Fusion. Med Image Comput Comput Assist Interv. 9350:313-320.
42. Williamson JR, Quatieri TF, Helfer BS, Perricone J, **Ghosh SS**, Ciccarelli G, Mehta DD. (2015) Segment-dependent dynamics in predicting Parkinson's disease. In Sixteenth Annual Conference of the International Speech Communication Association.

43. Sitek KR, Cai S, Beal DS, Perkell JS, Guenther F and **Ghosh SS** (2016). Decreased cerebellar-orbitofrontal connectivity correlates with stuttering severity: Whole-brain functional and structural connectivity associations with persistent developmental stuttering. Front. Hum. Neurosci. 10:190. doi: 10.3389/fnhum.2016.00190
44. Whitfield-Gabrieli S, **Ghosh SS**, Nieto-Castanon A, Saygin Z, Doehrmann O, Chai XJ, Reynolds GO, Hofmann SG, Pollack MH, Gabrieli JD. (2016) Brain connectomics predict response to treatment in social anxiety disorder. Mol Psychiatry.
45. Allen GI, Amoroso N, Anghel C, Balagurusamy V, Bare CJ, Beaton D, Bellotti R, Bennett DA, Boehme K, Boutros PC, Caberlotto L, Caloian C, Campbell F, Chaibub Neto E, Chang YC, Chen B, Chen CY, Chien TY, Clark T, Das S, Davatzikos C, Deng J, Dillenberger D, Dobson RJB, Dong Q, Doshi J, Duma D, Errico R, Erus G, Everett E, Fardo DW, Friend SH, Fröhlich H, Gan J, George-Hyslop P, **Ghosh SS**, Glaab E, Green RC, Guan Y, Hong MY, Huang C, Hwang J, Ibrahim J, Inglese P, Jiang Q, Katsumata Y, Kauwe JSK, Klein A, Kong D, Krause R, Lalonde E, Lauria M, Lee E, Lin X, Liu Z, Livingstone J, Logsdon BA, Lovestone S, Lyappan A, Ma M, Malhotra A, Mangravite LM, Maxwell TJ, Merrill E, Nagorski J, Namasivayam A, Narayan M, Naz M, Newhouse SJ, Norman TC, Nurtdinov RN, Oyang YJ, Pawitan Y, Peng S, Peters MA, Piccolo SR, Praveen P, Priami C, Sabelnykova VY, Senger P, Shen X, Simmons A, Sotiras A, Stolovitzky G, Tangaro S, Tateo A, Tung YA, Tustison NJ, Varol E, Vradenburg G, Weiner MW, Xiao G, Xie L, Xie Y, Xu J, Yang H, Zhan X, Zhou Y, Zhu F, Zhu H, Zhu S. (In press) Crowdsourced estimation of cognitive decline and resilience in Alzheimer's disease, Alzheimer's & Dementia, Available online 11 April 2016, ISSN 1552-5260, http://dx.doi.org/10.1016/j.jalz.2016.02.006.
46. Cameron Craddock R, S Margulies D, Bellec P, Nolan Nichols B, Alcauter S, A Barrios F, Burnod Y, J Cannistraci C, Cohen-Adad J, De Leener B, Dery S, Downar J, Dunlop K, R Franco A, Seligman Froehlich C, J Gerber A, **Ghosh SS**, J Grabowski T, Hill S, Sólon Heinsfeld A, Matthew Hutchison R, Kundu P, R Laird A, Liew SL, J Lurie D, G McLaren D, Meneguzzi F, Mennes M, Mesmoudi S, O'Connor D, H Pasaye E, Peltier S, Poline JB, Prasad G, Fraga Pereira R, Quirion PO, Rokem A, S Saad Z, Shi Y, C Strother S, Toro R, Q Uddin L, D Van Horn J, W Van Meter J, C Welsh R, Xu T (2016). Brainhack: a collaborative workshop for the open neuroscience community. Gigascience. 5:16. doi: 10.1186/s13742-016-0121-x. eCollection 2016. PubMed PMID: 27042293; PubMed Central PMCID: PMC4818387.
47. Gorgolewski KJ, Auer T, Calhoun VD, Craddock RC, Das S, Duff EP, Flandin G, **Ghosh SS**, Glatard T, Halchenko YO, Handwerker DA, Hanke M, Keator D, Li X, Michael Z, Maumet C, Nichols BN, Nichols TE, Pellman J, Poline JB, Rokem A, Schaefer G, Sochat V, Triplett W, Turner JA, Varoquaux G, Poldrack RA. (2016) The brain imaging data structure, a format for organizing and describing outputs of neuroimaging experiments. Sci Data. 3:160044. doi: 10.1038/sdata.2016.44. PubMed PMID: 27326542.
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111. Subash P, Gray A, Boswell M, Cohen SL, Garner R, Salehi S, Fisher C, Hobel S, **Ghosh S**, Halchenko Y, Dichter B, Poldrack RA, Markiewicz C, Hermes D, Delorme A, Makeig S, Behan B, Sparks A, Arnott SR, Wang Z, Magnotti J, Beauchamp MS, Pouratian N, Toga AW, Duncan D. A comparison of neuroelectrophysiology databases. Sci Data. 2023 Oct 19;10(1):719. doi: 10.1038/s41597-023-02614-0. Review. PubMed PMID: 37857685; PubMed Central PMCID: PMC10587056.
112. Zhao C, Jarecka D, Covitz S, Chen Y, Eickhoff SB, Fair DA, Franco AR, Halchenko YO, Hendrickson TJ, Hoffstaedter F, Houghton A, Kiar G, Macdonald A, Mehta K, Milham MP, Salo T, Hanke M, **Ghosh SS**, Cieslak M, Satterthwaite TD. A reproducible and generalizable software workflow for analysis of large-scale neuroimaging data collections using BIDS Apps. Imaging Neurosci. 2024;2:1–19. doi:10.1162/imag_a_00074.
113. Poldrack RA, Markiewicz CJ, Appelhoff S, Ashar YK, Auer T, Baillet S, Bansal S, Beltrachini L, Benar CG, Bertazzoli G, Bhogawar S, Blair RW, Bortoletto M, Boudreau M, Brooks TL, Calhoun VD, Castelli FM, Clement P, Cohen AL, Cohen-Adad J, D'Ambrosio S, de Hollander G, de la Iglesia-Vayá M, de la Vega A, Delorme A, Devinsky O, Draschkow D, Duff EP, DuPre E, Earl E, Esteban O, Feingold FW, Flandin G, Galassi A, Gallitto G, Ganz M, Gau R, Gholam J, **Ghosh SS**, Giacomel A, Gillman AG, Gleeson P, Gramfort A, Guay S, Guidali G, Halchenko YO, Handwerker DA, Hardcastle N, Herholz P, Hermes D, Honey CJ, Innis RB, Ioanas H-I, Jahn A, Karakuzu A, Keator DB, Kiar G, Kincses B, Laird AR, Lau JC, Lazari A, Legarreta JH, Li A, Li X, Love BC, Lu H, Marcantoni E, Maumet C, Mazzamuto G, Meisler SL, Mikkelsen M, Mutsaerts H, Nichols TE, Nikolaidis A, Nilsonne G, Niso G, Norgaard M, Okell TW, Oostenveld R, Ort E, Park PJ, Pawlik M, Pernet CR, Pestilli F, Petr J, Phillips C, Poline JB, Pollonini L, Raamana PR, Ritter P, Rizzo G, Robbins KA, Rockhill AP, Rogers C, Rokem A, Rorden C, Routier A, Saborit-Torres JM, Salo T, Schirner M, Smith RE, Spisak T, Sprenger J, Swann NC, Szinte M, Takerkart S, Thirion B, Thomas AG, Torabian S, Varoquaux G, Voytek B, Welzel J, Wilson M, Yarkoni T, Gorgolewski KJ. The past, present, and future of the brain imaging data structure (BIDS). Imaging Neurosci. 2024;2:1–19. doi:10.1162/imag_a_00103.
114. Low DM, Rao V, Randolph G, Song PC*, **Ghosh SS***. (2024) Identifying bias in models that detect vocal fold paralysis from audio recordings using explainable machine learning and clinician ratings. PLOS Digital Health.
115. Zuromski KL, Low D, Jones N, Kuzma R, Kessler D, Zhou L, Kastman EK, Epstein J, Madden C, **Ghosh SS**, Gowel D, Nock MK (in press). Detecting suicide risk among U.S. Servicemembers and Veterans: A deep learning approach using social media data. Psychological Medicine.
116. Kliemann D, Galdi P, Van De Water AL, Egger B, Jarecka D, Adolphs R*, **Ghosh SS***. (In press) Resting-state functional connectivity of the amygdala in autism: a preregistered large-scale study.

Presentations

Data availability, access, and transparency

Study Panel on The Science and Ethics of Measuring and Modeling Individual and Group Behavior, American College of Neuropsychopharmacology (ANCP), 2023

An Emerging Ecosystem for Psychopathology Research

Psychiatry Grand Rounds, Motto Endowed Lecture, University Hospitals and Case Western Reserve University, 2023

The transformative potential and challenges of open data and computation in neuroscience

BBQS Sensors Workshop, NIH, 2023

Using translational applications to unpack machine learning models and systemic challenges
Machine Learning in Medicine Seminar Series, Radiology, WCM & Electrical and Computer Engineering, Cornell-Ithaca and Cornell-Tech, 2023

Seeing precision psychiatry through the variability lens of data and technologies
American Psychopathological Association Conference, 2023

Can neuroinformatics infrastructures like DANDI advance scientific discovery?
NeuroDataShare: Exploring and sharing multi-scale neuroscience data, University College London, 2023

Unpacking the Speech Chain: A window of scientific and technological opportunities
Quantitative Life Sciences Seminar Series, McGill University, 2022

Leveraging brain research to change scientific culture, education, and infrastructure
Precision Convergence Webinar Series, McGill University and Pittsburgh Supercomputing Center, 2022

Towards precision psychiatry through diverse sensors and machine learning
Data Science in Clinical Settings Symposium, Fundación INECO, 2021

Into the neuroverse
OHBM Student and Postdoc Special interest group, 2021

Sensors and the Brain
CANDI Lab Shriver Center, University of Massachusetts Medical School, 2021
OSU-CN Yang Webinar series, Oregon State University, 2021

What constitutes a good standard for neuroscience?
INCF Virtual assembly, 2021

The Shifting Dunes of Data and Computation
University of Virginia, Biomedical Data Science Seminar, 2021

Reproducible Workflows and Analysis
ABCD-Repronim course, Florida International University, 2020

Challenging the Invisibility of Mental Illness
American Medical Informatics Association - INCF, 2020

The evolution of machine learning in brain imaging
Frontiers in Brain Imaging Symposium, University of Texas, Southwestern, 2020

What has working with brains, voice, and infrastructure technologies taught us about open science?
NeuroHub Seminar Series, McGill University, 2019

Retooling Psychiatry: How will we get there?
Computational Psychiatry Symposium, University of Iowa, 2019

Brains, Voice, and Technology: A multifaceted approach to mental health
Center for Depression, Anxiety, and Stress Research, McLean Hospital, 2019

Assistive Intelligence for Brain Health
World Medical Innovation Forum, 2019

Modeling Noise and Individual Variation
Organization for Human Brain Mapping, Singapore, 2018

Tools of the trade: From Data to Results in Neuroimaging
Neuroscience Information Framework, Online Webinar, 2018

Speaking one's mind: Vocal biomarkers of mental health
University of Washington, Seattle, August, 2018

A brain cartographer's quandary
Workshop on large-scale trends in cortical organization, Leipzig, Germany, 2017

Speaking one's mind: Vocal biomarkers of mental health
Technology in Psychiatry, Symposium, Boston, USA, 2017

The emerging informatics revolution in neuroscience
Boston Children's Hospital, Boston, USA, 2017
Center for Addiction Medicine, Massachusetts General Hospital, Boston, USA, 2017
Department of Biomedical Informatics, University of Pittsburgh, Pittsburgh, USA, 2017

Variance is the spice of reproducible research
Keynote: Annual Neuroinformatics Congress, Kuala Lampur, Malaysia, 2017

Applications of Machine Learning to Brain Imaging and Psychiatry
Computational Psychiatry Workshop, Satellite of Biological Psychiatry, San Diego, USA, 2017

Predicting Treatment Outcome in Social Anxiety Disorder and Tracking Major Depression and Parkinson State Using Behavioral Information
ACNP 55th Annual Meeting, Florida, USA, 2016

Standardized Provenance for Reproducible Dataflows in Neuroscience
Japan Neuroscience Society, Yokohama, Japan, 2016

Speaking one's mind: Vocal biomarkers of depression and Parkinson disease
Acoustical Society of America, Salt Lake City, USA, 2016

Predicting Treatment Outcome in Anxiety and Depression
McLean Hospital, Belmont, USA, 2015
Organization for Human Brain Mapping, Hawaii, USA, 2015

Linking Knowledge and Reproducible Research Via Standardized Provenance Models

Workshop at the Bernstein Computational Neuroscience conference, Heidelberg, Germany, 2015
Tools for Integrating and Planning Research in Neuroscience, UCLA, Los Angeles, USA, 2014

A Neuroinformatics Bridge to Personalized Healthcare
Boston University, Hearing research seminar, Boston, USA, 2014
Vanderbilt University, Nashville, USA, 2014

Enabling knowledge generation and reproducible research by embedding provenance models in metadata stores
Neuroinformatics Congress, Stochkholm, Sweden, 2013

Python Tools for Reproducible Research in Brain Imaging
PyData conference, Boston, USA, 2013

Nipype: Opensource platform for unified and replicable interaction with existing neuroimaging tools
Brigham and Womens Hospital, Boston, USA, 2009
Massachusetts General Hospital, Boston, USA, 2010, 2012, 2013
Radiology, U of Washington, Seattle, USA, 2011,
PICSL, U of Pennsylvania, Philadelphia, USA, 2011
Scientific Python Conference in India, Hyderabad, India, 2010
INCF Datasharing Workshop, Quebec, Canada, 2011
Python in Neuroscience Workshop, Paris, France, 2011

Leveraging scientific computation to bridge neuroimaging and clinical applications
Radiology, U of Pennsylvania, Philadelphia, USA, 2011
Haskins Laboratories, New Haven, Connecticut, USA 2012

Datasharing and reproducible research: Barriers and solutions
Janelia Farm Bioimage Informatics II Conference, Washington DC, USA, 2011
University de Montreal, Montreal, Canada, 2013

Using high-resolution fMRI to identify individual-specific speech motor regions
Surgical Brain-Mapping laboratory, Brigham and Womens Hospital, Boston, USA, 2010

Region of interest analysis of functional Magnetic Resonance Imaging data
New York State Psychiatric Institute, Columbia University, New York, USA, 2007
Singapore General Hospital, Singapore, Singapore, 2007

Exploring speech motor control through computational modeling and neuroimaging
Center for Life Sciences, National University of Singapore, Singapore, 2007

Research contracts and grants

Current

2023 - 2028	BRAIN Connects: The center for Large-scale Imaging of Neural Circuits (LINC) NIH/NINDS/1UM1NS132358-01 Site PI
2023 – 2025	Biometric assessment and monitoring of psychiatric symptoms

Child Mind Institute, New York
PI

2022 – 2026 Voice as a Biomarker of Health: Building an ethically sourced, bioacoustic database to understand disease like never before
NIH/OD/OT2 OD032720
MPI (co-PIs: see https://reporter.nih.gov/search/FS74E19pCEacUekazZnwjA/project-details/10858564)

2022 – 2027 An extensible brain knowledge base and toolset spanning modalities for multi-species data-driven cell types
NIH/NIMH/U24 MH130918
MPI (co-PI Shoaib Mufti, Michael Hawrylycz, Lydia Ng, Allen Institute for Brain Science)

2022 – 2025 ReadNet: Preventing Reading Failure
Harvard University
Site co-I

2020 – 2024 Nobrainer: A robust and validated neural network tool suite for imagers
NIH/NIMH/RF1 MH121885
PI

2019 – 2029 DANDI: Distributed Archives for Neurophysiology Data Integration
NIH/NIMH/R24 MH117295
MPI (co-PI - Yaroslav Halchenko, Dartmouth College)

2016 – 2026 ReproNim: Center for Reproducible Neuroimaging Computation
NIH/NIBIB/P41 EB019936 (PI: David Kennedy, UMass Medical School)
Director: Technology, Research and Development Project 2
Member of administrative and training cores
Site PI

Past

2008 – 2010 Dissemination of cross-platform software for artifact detection and region of interest analysis of fMRI data
NIH/NIBIB/R03 EB008673
Co-PI with Susan Whitfield-Gabrieli, McGovern Institute for Brain Research, MIT

2012 – 2014 Learned regulation of the limbic network via combined EEG and fMRI (PI: John Gabrieli)
NIH/NIMH/R21 MH092564
Investigator

2012 – 2015 MURFI: An Optimized Platform for Realtime fMRI Neurofeedback
MIT McGovern Institute Neurotechnology Program
Co-PI with John Gabrieli (MIT), Eden Evins (MGH)

2011 – 2016 Using Real-Time Functional Brain Imaging and Computer Training To Enhance Recovery from Traumatic Brain Injury (TBI) (PI: John Gabrieli)
DOD/Clinical trial award PT100120
Investigator

2015 – 2017 Genetic Determinants of Schizophrenia Intermediate Phenotypes
NIH/NIMH/R01 (Supplement) MH092380 (PI: Tracey Petryshen, MGH)
Site PI

2012 – 2017 A randomized controlled trial of intranasal oxytocin as an adjunct to behavioral therapy for autism spectrum disorder (PI: John Gabrieli, MGH)
DOD/Clinical Trial Award AR110329

Site PI

2014 – 2017 Brain basis for voice-based tracking of neurological disorders
MIT McGovern Institute Neurotechnology Program
MIT Lincoln Lab Funds
Co-PI with Tom Quatieri, MIT Lincoln Laboratory, MIT

2012 – 2018 Blast Induced Traumatic Brain Injury
DOD/Institute for Soldier Nanotechnologies
Investigator

2015 – 2020 Connectomes related to anxiety and depression in adolescents.
NIH/NIMH/U01 MH108168 (PI: Susan Whitfield-Gabrieli, John Gabrieli, MIT)
Informatics Lead

2016 – 2020 Nipype: Dataflows for Reproducible Biomedical Research
NIH/NIBIB/R01 EB020740
PI

2019 – 2020 Tracking Alzheimer's Disease from Retinal OCT Images using Deep Learning
Foundation for Ophthalmology Research and Education International, Inc.
PI

2020 – 2021 Realtime speech modification apparatus for enhancing fluency in people that stutter.
McGovern Institute Neurotechnology Program
PI (co-PI Tod Machover, Media Arts and Sciences)

2019 - 2022 The Neuroimaging Data Model: FAIR descriptors of Brain Initiative Imaging Experiments
(PI: David Keator, University of California, Irvine)
National Institute of Mental Health, R01
Site PI

2016 – 2022 NeuroScout: A cloud-based platform for rapid re-analysis of naturalistic fMRI datasets
NIH/NIMH/R01 MH109682 (PI: Tal Yarkoni, UTexas, Austin)
Site PI

2020 – 2023 Mumble Melody: A real-time speech modification system to enhance fluency in people who stutter
MIT Deshpande Center for Technological Innovation
PI (co-PI Tod Machover, Media Arts and Sciences)