Archith Rajan,Ph.D

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Current Affiliation

Postdoctoral researcher (February 2023 – Present: Expected end date: February 2026)
Department of Radiology, Perelman School of Medicine, University of Pennsylvania, Philadelphia, USA
PIs: Dr. Suyash Mohan and Dr. Sanjeev Chawla

- *Area of Research: Advanced MRI and MR Spectroscopy in brain tumors*

Research Experience

Junior Research Fellow (May 2023 – January 2023)
Department of Neuroimaging and Interventional Radiology, National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, India
PIs: Dr. Pardeep Kumar and Dr. Jitender Saini

- *Area of Research: Comparing the efficacy of different tracers using PET and SPECT in glioma characterization*

Graduate Student (November 2018 – January 2023)
Symbiosis Centre for Medical Image Analysis, Pune, India.
PI: Dr. Madhura Ingalhalikar, Symbiosis Centre for Medical Image Analysis, Pune, India.
Co-PI: Dr. Nandini C. Singh, National Brain Research Centre, Delhi, India

- *Area of Research: Brain correlates of Music Perception*

Project Assistant (September 2016 – November 2018)
Junior Research Fellow (October 2015 – August 2016)
Language, Literacy and Music Lab of Dr. Nandini C. Singh *at* National Brain Research Centre, Manesar, India

Through the course of these assignments, I have picked up the following skills:

- *MR Image Acquisition using Philips 3T Achieva and Siemens Prisma, esp. Diffusion Weighted EPIs*
- *Analysis of DWI and fMRI images using FSL, SPM, MRtrix3*
- *Fiber Tractography using TrackVis , FSL, MRtrix3*
- *Analysis of MR Spectroscopy using LCModel (SVS, CSI) and MIDAS (MRSI)*

Software and Programming Expertise

- Proficiency in various MR Image analysis software: ANTs, SPM (VBM, fMRI), FSL (DTI-TBSS, Tractography), TrackVis (Tractography), MRtrix3 (HARDI Analysis) and FreeSurfer (Cortical Parcellation, Cortical Thickness), ITK-Snap, and 3D-Slicer (Tumor segmentation)
- Proficiency in various MR spectroscopy (MRS) and Imaging (MRSI) software: LCModel (SVS, CSI), FSL-MRS and MIDAS (MRSI)

- Proficiency in MATLAB and basic knowledge of bash shell scripting and Python programming languages.
- Fluent in using the Microsoft packages – Word, Excel and Powerpoint

Educational qualifications

PhD, Engineering (2023)
Symbiosis Centre for Medical Image Analysis (SCMIA), Symbiosis International (Deemed) University, Pune, India

Master of Technology, Biomedical Engineering (2015)
Division of Biomedical Engineering, VIT University, Vellore, Tamil Nadu, India
CGPA: 8.36

Bachelor of Technology, Electronics and Biomedical Engineering (2012)
TKM Institute of Technology, Cochin University of Science and Technology, Cochin, Kerala, India
CGPA: 6.1

Projects, Publications, and Conference abstracts

- *Project: Simultaneous assessment of white matter microstructure and metabolite profiles in normal, healthy adults*
  Rajan A, Hanaoka M, de Godoy LL, Gewolb D, Dutweiler E, Sheriff S, Poptani H, Mohan S, Chawla S. Along The Tract Analysis of Metabolite Profile and Microstructural Integrity in the Superior Longitudinal Fasciculus of Normal Healthy Brains. Virtual power pitch at the **ISMRM Diffusion Study Group Trainee Day: 24 Hours Around the World!**

  Rajan A, Hanaoka M, de Godoy LL, Gewolb D, Dutweiler E, Sheriff S, Poptani H, Mohan S, Chawla S. Simultaneous Assessment of Microstructural integrity and Metabolite Profile from Superior Longitudinal Fasciculus in Normal Healthy Brain. Accepted Digital Poster at the **ISMRM & ISMRT Annual Meeting & Exhibition**. 04-09 May 2024, Singapore

- *Project: Comparing the efficacy of different tracers using PET and SPECT in glioma characterization*
  Kumar P, Kumar A, Nagaraj C, Sadashiva N, Saini J, Mangalore S, **Rajan A**, Sitani K, Beniwal M, Santosh V, Basavaraja H. Evaluating the Diagnostic Efficacy of 99mTc-Methionine Single-Photon Emission Computed Tomography–Computed Tomography: A Head-to-Head Comparison with 11C-Methionine Positron Emission Tomography–Magnetic Resonance Imaging in Glioma Patients. **Cancer Biotherapy and Radiopharmaceuticals. 2024 Feb 7**.

- *Project: Multiparametric MRI and MRS based assessment and prognostication of Glioma patients*

  de Godoy LL, **Rajan A**, Banihashemi A, Patel T, Desai A, Bagley S, Brem S, Chawla S, Mohan S. Response Assessment in Long-Term Glioblastoma Survivors Using a Multiparametric MRI-Based Prediction Model. **Brain Sciences**. 2025 Jan 31;15(2):146.

  de Godoy LL, **Rajan A**, Berger B, Sheriff S, Sarkar A, Shah R, Aregawi D, Morrison T, Hosur S, Shah S, Shukla G, Lanciano R, Jain V, Herbert S, Amankulor N, Weiss S, Giri A, Padmanabhan A, Bagley S, Lim KC, Ribeiro de Paula D, Lee D, Vineis K, Desiderio L, Mohan S, Chawla S. Integration of Whole Brain Spectroscopic Imaging in Planning Workflow for Personalized Delivery of TTFields in Glioblastomas. **Summa Cum Laude at the ISMRM 2024 Annual Meeting.** May 4-9. Singapore

de Godoy LL, Lim KC, **Rajan A**, Verma G, Hanaoka M, O'Rourke DM, Lee JY, Desai A, Chawla S, Mohan S. Non-invasive assessment of isocitrate dehydrogenase-mutant gliomas using optimized proton magnetic resonance spectroscopy on a routine clinical 3-Tesla MRI**. Cancers. 2023 Sep 7;15(18):4453**.

Rajan A, de Godoy LL, Wolf RL, Nasrallah MP, O'Rourke DM, Loevner LA, Mohan S, Chawla S. Multiparametric Analysis to Differentiate Recurrent Tumor from Radiation Necrosis in Glioblastoma. Oral presentation at the **35th Annual Meeting of The Eastern Neuroradiological Society (ENRS)**. August 24-27, 2023. Charleston, South Carolina, USA.

Rajan A, Mohan S, de Godoy LL, Brem S, O'Rourke DM, Nasrallah MP, Loevner LA, Chawla S. Quantitative Multiparametric MRI and Machine Learning based Model to differentiate True Progression from Pseudo-progression in Glioblastomas: A Step Towards Precision Neuro-Oncology. **Annual meeting of the Radiological Society of North America.** November 26-30. Chicago, Illinois, USA.

Rajan A, de Godoy LL, Wolf RL, Nasrallah MP, O'Rourke DM, Loevner LA, Mohan S, Chawla S. Multiparametric Analysis to Differentiate Recurrent Tumor from Radiation Necrosis in Glioblastoma. Accepted Oral presentation at the **Annual Meeting of the American Society for Neuroradiology (ASNR)**. May 18-22, 2024. Las Vegas, Nevada, USA.

Hosseini SA, Servaes S, Hall B, Bhaduri S, **Rajan A**, Rosa-Neto P, Brem S, Loevner LA, Mohan S, Chawla S. Quantitative Physiologic MRI Combined with Feature Engineering for Developing Machine Learning-Based Prediction Models to Distinguish Glioblastomas from Single Brain Metastases. **Diagnostics**. **2024 Dec 27;15(1):38**.

Yadav VK, Mohan S, Agarwal S, de Godoy LL, **Rajan A**, Nasrallah MP, Bagley SJ, Brem S, Loevner LA, Poptani H, Singh A. Distinction of pseudoprogression from true progression in glioblastomas using machine learning based on multiparametric magnetic resonance imaging and O6-methylguanine-methyltransferase promoter methylation status. **Neuro-Oncology Advances**. 2024 Jan;6(1): vdae159

- *Project: Music Perception skills in a normative population*

Rajan A, Shah A, Ingalhalikar M, Singh NC. Structural connectivity predicts sequential processing differences in music perception ability**. European Journal of Neuroscience. 2021 Sep;54(6):6093-103.**

Rajan A, Valla JM, Alappatt JA, Sharda M, Shah A, Ingalhalikar M, Singh NC. Wired for musical rhythm? A diffusion MRI-based study of individual differences in music perception**. Brain Structure and Function. 2019 Jun 1; 224:1711-22.**

Rajan A, Shah A, Ingalhalikar M and Singh NC. Associations of Individual differences in Interhemispheric structural connectivity with music perception abilities minimally dependent on training**.** Online poster*,* **Neuromusic VII,** 18-21 June 2021, Aarhus, Denmark.

Rajan A, Shah A, Ingalhalikar M and Singh NC. Associations of Musical Aptitude with High Angular Resolution Diffusion Imaging (HARDI) derived structural connectivity. *Digital poster* at *the **ISMRM & ISMRT Annual Meeting & Exhibition, 2021***.

Rajan A, Alappatt JA, Shah A, Sharda M, Valla JM, Ingalhalikar M and Singh NC. Wired for Music? A Diffusion MRI based study of normative music perception skills. Accepted Abstracts**: ISMRM-ESMRMB**, 2018, Paris, OHBM, 2018, Singapore.

- *Project: Neuroimaging based differential diagnosis of Movement disorders*

Prasad S, **Rajan A**, Bharath RD, Saini J, Pal PK. Microstructural abnormalities of the dentato-rubro-thalamo-cortical tract in tremor dominant Parkinson's disease and essential tremor plus syndrome. **Neuroradiology. 2025 Jan 20:1-2.**

Prasad S, **Rajan A**, Ingalhalikar MA, Bharath RD, Saini J, Pal PK. Probabilistic tractography based tremor network connectivity in tremor dominant Parkinson's Disease and Essential tremor plus**. Brain Connectivity. 2024 Jun 14(ja).**

Tupe-Waghmare P, **Rajan A**, Prasad S, Saini J, Pal PK, Ingalhalikar M. Radiomics on routine T1-weighted MRI can delineate Parkinson's disease from multiple system atrophy and progressive supranuclear palsy. **European radiology. 2021 Nov;31(11):8218-27.**

Prasad S, **Rajan A**, Pasha SA, Mangalore S, Saini J, Ingalhalikar M, Pal PK. Abnormal structural connectivity in progressive supranuclear palsy—Richardson syndrome**. Acta Neurologica Scandinavica. 2021 Apr;143(4):430-40.**

Saini J, Prasad S, **Rajan A,** Pal P, Ingalhalikar M. T1 posterior fossa radiomics based diagnosis of Essential tremor. Conference abstract in **Movement Disorders 2022 Sep 1 (Vol. 37, pp. S432-S432).**

- *Project: White Matter differences in Monolinguals and Bilinguals*
  Singh, NC, **Rajan, A**, Malagi, A, Ramanujan, K, Canini, M, Della Rosa, PA, Raghunathan, P, Weekes, BS, and Abutalebi, J. 2018. Microstructural anatomical differences between bilinguals and monolinguals**.** ***Bilingualism: Language and Cognition, 21(5), 995-1008.***

- *Project: Functional Connectivity based prediction of Autism Spectral Disorder*
  Ingalhalikar M, Shinde S, Karmarkar A, **Rajan A**, Rangaprakash D, Deshpande G. Functional connectivity-based prediction of autism on site harmonized ABIDE dataset. **IEEE Transactions on Biomedical Engineering. 2021 May 14;68(12):3628-37.**

References

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