Dr. Ayan Sengupta

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Education

Ph.D. (Dr. rer. nat.), Experimental Psychology 2013-2016
Otto-von-Guericke-Universität (DFG Grant) Germany
Thesis: *The Effect of Acquisition Resolution and Magnetic Field Strength on Multivariate Decoding of fMRI*

M.S., Computer Science and Engineering 2010-2012
University of Nebraska, Lincoln USA
Thesis: *MRI and histo-pathological image co-registration of brain for HIV-based murine model of neurocognitive decline*

B.Tech., Electronics and Communication Engineering 2004-2008
West Bengal University of Technology India

Professional and Research Experience

Postdoctoral Research Fellow 2016-present
Sir Peter Mansfield Imaging Center
University of Nottingham UK
Supervisor: **Prof. Susan Francis**, Dept. of Physics and Astronomy

- Somatotopic mapping of digits in human primary somatosensory cortex.
- Multivariate Analysis of BOLD response to Intraneural Microstimulation and vibrotactile stimulation

DFG Research Associate 2013-2016
Otto-von-Guericke-Universität Germany
Supervisor: **Prof. Michael Hanke**, Dept. of Psychoinformatics, OVGU
Co. Supervisor: **Prof. Stefan Pollmann**, Dept. of Experimental Psychology, OVGU
Co. Supervisor: **Prof. Oliver Speck**, Dept. of Biomedical Magnetic Resonance, OVGU

- Multivariate Pattern Analysis of ultra-high field (7T) multi-resolution fMRI for orientation decoding in human primary visual cortex.
- Comparison of Magnetic Field Strength (3T vs 7T) for better SNR and sensitivity in multi-resolution fMRI, to find its contribution to orientation classification analysis.

Technical Officer, Govt. of India 2012-2013
National Brain Research Center India
Collaborator: **Prof. Alan Evans**, MNI, McGill University

- Designed and implemented of the first Tele-Medicine grid of Neuroscience in India in collaboration with McGill University, Montreal. This project was an extension of **LORIS** platform for studying Dementia in the aging population in India.
- Research on determining track followed by neural stem cells from sub-ventricular zone to the area of infarct during neurogenesis in stroke models of rodents. Worked on co-registration of MR angiography and DTI image volumes in this project.
- Worked on the field of Computational Neuroscience, designing and running fMRI experiments.

Visiting Scholar 2012
National Institute of Mental Health and Neurosciences India
Supervisor: **Dr. John P. John**, Dept. of Psychiatry, NIMHANS

- Hands-on experience in Multi-modal Imaging like fMRI,MRS, EEG, High-Angular DTI
- Analysis and correlation of fMRI and DTI images

Graduate Researcher and Teaching Assistant 2010-2012
University of Nebraska Lincoln USA
Supervisor: **Prof. Ashok Samal**, Dept. of Computer Science, UNL
Co. Supervisor: **Prof. Yutong Liu**, Dept. of Radiology, UNMC

- Worked in collaboration with University of Nebraska Medical Center, USA on a project involving automatic landmark selection and optimization of landmarks, for non-linear co-registration of MRI slices of rat brains with corresponding histological images. This project was done for tracking growth of HIV induced neuro-cognitive disorders in murine models.
- Taught 'Introduction to computer Science with Java' and was in-charge of 'Introduction to data structure and algorithms' laboratory

Programmer Analyst 2008-2010
Cognizant Technology Solutions India

- Defect-resolving and performance-tuning of databases. Worked on design and development of Global Strategic Trading Platform of JP Morgan Chase Bank, USA
- Sybase Analyst and Developer, Java developer

Academic Honors

- **DFG Research Assistantship**, Otto-von-Guericke-Universität, Germany 2013
- **Graduate Teaching Assistantship**, University of Nebraska, USA 2010
- **Chancellor's Fellowship**, University of Nebraska, USA 2010
- **Oracle 9i PL/SQL Award of Achievement from Oracle University** 2010
- **Sun Certified JAVA programmer (SCJP 1.5)** 2009
- **National Merit Scholarship**, India 2002 and 2004

Technical Strengths

- Programming Languages: Python, MATLAB, BASH, C++, JAVA
- Neuroimaging Softwares: PyMVPA, FSL, Freesurfer, AFNI

Publications

- **Ayan Sengupta** and Michael Hanke. *Spatial band-pass filtering boosts accuracy of decoding musical genres from 7T fMRI data of auditory cortex* (in preparation).

- **Ayan Sengupta**, Renat Yakupov, Oliver Speck, Stefan Pollmann, Martin Kanowski, Claus Tempelmann and Michael Hanke. *The Effect of different MR field strengths (7 Tesla vs. 3 Tesla) on orientation decoding: A Comparison Study* (in preparation).

- **Ayan Sengupta**, Renat Yakupov, Oliver Speck, Stefan Pollmann and Michael Hanke. *The effect of acquisition resolution on orientation decoding from V1 BOLD fMRI at 7 Tesla* (NeuroImage).

- **Ayan Sengupta**, Renat Yakupov, Oliver Speck, Stefan Pollmann and Michael Hanke. *Ultra high-field (7Tesla) multi-resolution fMRI data for orientation decoding in visual cortex* (Data in Brief).

- **Ayan Sengupta**, Falko Kaule, J. Swaroop Guntupalli, Michael B. Hoffmann, Christian Häusler, Jörg Stadler and Michael Hanke. *A studyforrest extension, retinotopic mapping and localization of higher visual areas* (Scientific Data).

- Michael Hanke, Nico Adelhöfer, Daniel Kottke, Vittorio Iacovella, **Ayan Sengupta**, Falko R. Kaule, Roland Nigbur, Alexander Q. Waite, Florian Baumgartner and Jörg Stadler. *A studyforrest extension, simultaneous fMRI and eye gaze recordings during prolonged natural stimulation* (Scientific Data).

- Samir Das, Cécile Madjar, **Ayan Sengupta**, Zia Mohades. *LORIS: DICOM anonymizer* (GigaScience).

- **Ayan Sengupta**. *Automation of Landmark Selection for Rodent Brain MRI-Histology Registration using Thin-Plate Splines*.

Conference Presentations

Presenter

- Ayan Sengupta, Renat Yakupov, Oliver Speck, Stefan Pollmann and Michael Hanke (2015). **Optimal Resolution and Filtering for Orientation Decoding in V1 at 7T**. Organization of Human Brain Mapping 2015. Presentation delivered at the Organization of Human Brain Mapping 2015 meeting, Honolulu, Hawaii, June, 2015.
- Ayan Sengupta, Cecile Madjar and Samir Das (2014). **DicAT - DICOM Anonymization Tool** Organization of Human Brain Mapping 2014. The software was conceived, developed and presented in collaboration with LORIS team of McGill University at the Organization of Human Brain Mapping Hackathon, Berlin, June, 2014.
- Ayan Sengupta, Michael D. Boska, Howard E. Gendelman, Ashok Samal and Yutong Liu (2012). **Automation of Landmark Selection for Rodent Brain MRI-Histology Registration using Thin-Plate Splines**. Nebraska Annual Research Symposium 2012, Lincoln, Nebraska, 2012.

Abstracts

- Ayan Sengupta, Denis Schluppeck, Eleanor Barrat, Julien Besle, Susan Francis and Rosa Sanchez-Panchuelo. **A Probabilistic Atlas of Digit Somatotopy in the Human Primary Somatosensory Cortex** (ISMRM 2018 submission).
- Ayan Sengupta, Roger Holmes-Watkins, Rochelle Ackerley, Rosa Sanchez-Panchuelo Johan Weissberg and Susan Francis. **Global responses to microstimulation at 7T and comparison with vibrotactile stimulation** (ISMRM 2018 submission).