
BIO-SKETCH / Curriculum Vitae**NAME:** Banerjee, Arpan, PhD, FNASc**POSITION TITLE:** Scientist VII/ Professor, National Brain Research Centre (India)**LAB WEBSITE:** <https://cbdlnbrc.weebly.com/>**ACADEMIC WEB PAGE:** <http://www.nbrc.ac.in/newweb/research/groups/arpan-banerjee>

CURRENT PROFILE: Technologist, Professor and Principal investigator of Cognitive Brain Dynamics Lab @National Brain Research Centre, Manesar, India. Mentored research team of more than 50 people (PhD & Msc students, post-docs, research assistants) adept in performing cutting edge research on brain dynamics using EEG/ MRI/ MEG technologies in last 12 years which have resulted in several publications in top tier international journals and conference presentations grounded in core values of diversity and inclusion. Received prestigious grants from national (Department of Biotechnology / Ministry of Youth Affairs and Sports) and international bodies (Bill & Melinda Gates Foundation).

RESEARCH INTERESTS: Human perception and cognition using behavioral techniques, ageing and childhood development, interoceptive processing, emotion, mental health, neurophysiology (EEG/ MEG) and brain imaging (MRI), machine learning, data science, pattern recognition, artificial intelligence, image and signal processing, multi-scale neural models using nonlinear dynamical systems.

WORK EXPERIENCE & EDUCATION

INSTITUTION AND LOCATION	POSITION/ DEGREE	Completion Date	FIELD OF STUDY
National Brain Research Centre, India	Professor/ Scientist VI	01/2023 – till date	Computational & Cognitive neuroscience
National Brain Research Centre, India	Additional Professor/ Scientist V	10/2018 - 12/2022	Computational & Cognitive neuroscience
National Brain Research Centre, India	Associate professor/ Scientist IV	05/13 - 09/2018	Computational & Cognitive neuroscience
National Institutes of Health, Bethesda, USA	Research-fellow FTE	09/2009- 04/2013	Computational Neuroimaging
Center for Neural Sciences, New York University, New York, USA	Assistant Research Scientist	08/2007 - 08/2009	Computational Neuroscience
Florida Atlantic University, Boca Raton, USA	PhD	08/2002- 06/2007	Complex Systems & Brain Sciences
University of Pune, India	MSc (First class)	08/2002	Physics (Specialization: Nonlinear Dynamics)
Presidency College, Kolkata, India	BSc (First class)	09/2000	Honors in Physics

A. Recognition and Honors

Awards & honors

2025	Elected Associate Fellow, Indian National Science Academy (INSA)
2024	Elected fellow, National Academy of Sciences of India (NASI)
2016	Japan Neuroscience Society Travel award
2013	Innovative Young Biotechnologist Award (IYBA), Department of Biotechnology, Govt. of India
2013-2018	Ramalingaswami Fellowship, Department of Biotechnology, Govt. of India
2010	Fellows Award for Research Excellence (FARE), National Institutes of Health
2007-2009	Computational Neuroscience post-doctoral fellowship from The Swartz Foundation
2000-2002	Thermax Limited fellowship for pursuing MSc Physics
2001	Best all-round student in Physics, Indian Physics Teachers Association, Pune, India

Recognition, Leadership and Service

2025-	Editorial Board member, Discover Neuroscience (Formerly: Neural development)
2025-	Editorial Board member, BMC Neuroscience
2023-	Editorial Board member, Imaging Neuroscience, MIT Press
2023-	Convener, Working Group 2 on BCI Use case applications - International Electrotechnical Commission (IEC)/ ISO Working Group on Brain Computer Interfaces JTC 1/SC 43/WG 2 Applications (Elected position among Permanent member countries of IEC/ ISO)
2023-	Member, Board of Studies, SGT University Gurugram
2022-	Member, Bureau of Indian Standards (BIS) Panel 7 on Brain computer interfaces
2022-	Visiting Professor of Department of Psychology at Ashoka University
2021-2023	Editorial Board Member, NeuroImage (Elsevier)
2017-	Associate Editor, Frontiers in Computational Neuroscience
2022-	Review Editor, Frontiers in Cognition
2021-	Review Editor, Frontiers in Network Physiology
2013-	Review Editor, Frontiers in Brain Imaging Methods
2016-	Executive Committee Member/Treasurer, Association for Cognitive Sciences, India
2014- 2017	Selection Committee Member– Interview, Indo-US Fulbright fellowship program
2013-	Life Member, Indian Academy of Neurosciences
2007-	Member, Society for Neuroscience

B. Contribution to Science

Completed Research Projects

Swartz Foundation postdoctoral fellowship in Computational Neuroscience 08/01/2007-08/31/2009
Role: Recipient fellow (90000 US \$)

Neural information processing underlying eye-hand coordination

The goal of this project was to develop computational tools for analyzing spike trains and local field potential data from posterior parietal cortex of macaque monkeys with the goal of extracting the key information processing events underlying eye-hand coordination tasks. The project resulted in two publications and a MATLAB toolbox for neurophysiological data analysis.

Innovative Young Biotechnologist Award (IYBA) , Government of India 08/01/2014-07/31/2017
Role: PI (Total cost 38.8 lakhs INR)

How do vision influence speech perception? The goal of this project was to investigate the neural mechanisms underlying audio-visual and other multisensory mechanisms required for perception of speech sounds. This resulted in widely cited publications on questions related to audio-visual integration paradigms and development of lab infrastructure to perform cutting edge experiments

Ramalingaswami Fellowship, Department of Biotechnology, Government of India 05/01/2013-04/30/2018
Role: PI (Total cost 86 Lakhs INR)

Neurocognitive networks underlying goal directed behavior: The goal of this project was to develop brain network analysis tools to assess the communication and coordination among large scale neural ensembles to effectuate complex cognitive behavior. The project opened many leads in understanding neural oscillations underlying multisensory processing and ageing

Department of Biotechnology, Ministry of Science & Technology. Flagship programme of NBRC (4.77 Cr INR)
Oct 2019 –Sept 2022

Comparative mapping of common mental disorders (CMD) over lifespan Aim of this project was to build a multidimensional database of genomic and neuroimaging data from patients with common mental disorders of India and a healthy normal cohort that is age matched between 18-80 years.

Ongoing Research Projects (PI role only)

Bill and Melinda Gates Foundation

Artificial Intelligence Methods for Low Field MRI Enhancement 2023 - 2026

Aim of this project is to develop software tools to develop high resolution images from low field MR at 0.5 T and make them comparable to 3T specifically targeted for pediatric cohorts. I am part of a team led by Kings College London, UK and comprising University of Calgary, Canada, University of Cape Town, South Africa. (113 k USD)

Department of Sports, Ministry of Youth Affairs & Sports (Total cost 66 lakh INR) 2023 - 2026

Early diagnosis and structural and functional decline of the brain and associated injuries in professional athletes playing contact sports. Aim of this project is to identify neuroimaging based markers for chronic traumatic encephalopathy (CTE) induced from brain injuries in boxing and other contact sports

Department of Biotechnology (Total cost 20 crores INR)

Till Dec 2025

National Dementia Science Program. Aim of this project is to identify and characterize the prevalence of dementia in rural populations of North India, identify early onset biomarkers.

Selected Talks in International and National events

Feb 2025: Invited talk at Alzheimer's Association International Conference AAIC 2025, AI based connectomics for ageing disorders

Feb 2025: Invited talk in CMC Vellore, Whole brain connectomics platform to gain insights to health and disease.

August 2024: Invited talk at IISER Berhampore, Whole brain connectomics platform to track health and disease.

Jan 2024: Invited talk at IIT Chennai, Whole brain connectome models to infer structure and function from EEG/MEG/ fMRI

March 2023: Public outreach talk in Prime Minister's eVidya Channel operated by Department of Education in Science and Mathematics, National Council of Educational Research and Training: *Brain- An exploration like no other*

Feb 2023: Invited Talk, Cognitive Science Seminar Series, IIT Delhi

Jan 2023: Invited Talk as resource person Neuroimaging Seminar, Belur Math Kolkata

Nov 2022: 3 Original poster presentations at Society for Neuroscience Annual Meeting at San Diego, USA

March 2022: Invited speaker for Brain Awareness week IISER Behrampore, Title: Brain, mind, and behavior: The ethereal triumvirate.

March 2021: Invited speaker at Royal Society Yusuf Hamied Workshop for India and the UK organised by the Royal Society (UK) and the Indian National Science Academy (INSA)

Nov 2019: Invited speaker at Brain Modes, 2019, Pokhara, Nepal: Decoherence theory of perception

Nov 2019: 3 Original poster presentations at Society for Neuroscience Annual Meeting at Chicago, USA

Sept 2019: NeuroAI & **Oct 2019** IIT Delhi: Can data science lead us to the grand unified theory of brain function?

Oct 2018: at Montreal Neurological Institute, Montreal Canada in Auditory processing and plasticity meeting organized by IDRC project from Israel-Canada research consortium (Invited talk)

Oct 2018: at Penn State University, Hershey Park. Invited departmental seminar

July 2018: at Indian Institute of Science, Bangalore, SPCOM, International Conference on Signal processing and communications (IEEE). (Invited tutorial)

Nov 2017: at LV Prasad Eye Institute in a Indo-German Seminar funded by Leopoldina Program and DFG (Germany). (Invited Talk)

Nov 2017: 3 Original poster presentations at Society for Neuroscience Annual Meeting at Washington, DC, USA

July 2017: International Center for Theoretical Sciences, Bangalore: Multisensory representational space of cross-modal perception (Invited Talk)

July 2016: Japan Neuroscience Society Annual Meeting: Neurocognitive network dynamics underlying multisensory perception (Original research presentation)

Dec 2015: International Conference on Cognition, Brain and Computation, IIT Gandhinagar: Spatiotemporal structure of multisensory perception (Invited talk)

June 2015: International Multisensory Research Forum (IMRF), Pisa, Italy: Multisensory perception, but not multisensory stimuli drive the activity of posterior superior temporal sulcus (pSTS). (Original research presentation)

Mar 2014: Institute of Plasma Research, Gandhinagar: Neuro-cognitive network dynamics underlying action & perception (Invited talk)

Dec 2013: International Conference on Cognition, Emotion & Action, IIT Gandhinagar: Organization of brain and behavior during coordination (Invited talk)

C. Contribution to teaching/ training

PhD students trained (Total: 18 including graduated & enrolled)

Graduated 8 as Supervisor

Dr G. Vinodh Kumar, 2019, Currently post-doc at Penn State University, USA

Dr Guncha Bhasin, 2022, Currently post-doc at University of Nevada, Las Vegas, USA

Dr Priyanka Ghosh, 2022, Currently post-doc at Northeastern University, Boston, USA

Dr Anagh Pathak, 2023, Currently post doc at University of Strasbourg, France

Dr Neeraj Kumar, 2023, Currently post-doc at Georgetown University, USA

Dr Nisha Chetna Sastry, 2024 Currently Research Engineer Mathworks, Inc
Dr Ritu Moni Borah, 2025
Dr Partika Jain, 2026

Currently enrolled as supervisor 10: Kirti Saluja, Vinsea AV Singh, Ankit Yadav, Azman Akhtar, Shashwati Tripathi, Vinitha Vinod, Rishabh Bapat, Tanmay Singhal, Medha Bhinwar, Dr Pratik

As Co-Supervisor,4: Dr Indrajith Nair, Dr Shalini Sharma, Dr Gargi Majumdar, Dr Abhishek Singh Narvaria

US-India Fulbright fellow: Ms Megha Vemuri

Post-doc alumni: 8

Dr Dipanjan Ray (currently Assistant professor, Ashoka University, India)
Dr Amit Naskar (own start up)
Dr Priyanka Chakraborty (Assistant professor, Rampurhat College, West Bengal)
Dr Gaurav Sharma (post doc, U Toronto)
Dr Soibam Shyamchand Singh (post-doc, Ashoka University)
Dr Zinkal Shah, Senior resident, Amrita University Hospital, Faridabad
Dr Suman Saha, Assistant Professor, Vellore Institute of Technology (VIT)
Dr Dhrubajyoti Das (Institute Post doc, IIT Kharagpur)

MSc Students: Graduated 15

External Examiner for PhD: 13

Current gender ratio of lab: 5 Females, 5 males

Research assistants: 10

Lab Alumni at Elekta, Inc & Aalto University (Finland), IITBombay – Monash University joint PhD program, Aix-Marseilles University (France), BCBL- San Sebastian (Spain), Penn State (US), University of Queensland (Australia), University of Louvain (Belgium), University of Melbourne, Deakin University

Courses taught:

At NBRC (2013-till date): Computational Neuroscience, Cognitive Neuroscience, Quantitative Analysis, Biostatistics

At Ashoka University, Department of Psychology (2022-till date): Mind and Behaviour (Foundation course for undergraduates from all disciplines)

At Florida Atlantic University, Department of Physics (2022-2004): General Physics for Undergrads (Teaching assistant), General Physics Lab Instructor.

D. Contribution towards institution development (Intra and extramural)

- Chair, Technical Services Committee, NBRC, 2023 -2025
- MRI Purchase Committee IISER Behrampore, India, 2022
- Coordinator of Computing facility in NBRC, 2021 -
- Member in Human Ethics Committee (NBRC) 2021 onwards
- Faculty search and screening committee of NBRC

- MRI purchase committee of NBRC, 2018-2020
- Organized Ramalingaswami Fellows Conclave, 2019
- Organized one of the most premier mid-size international conference involving 150 people (about one-third foreign delegates) in the field of Computational Neuroscience as the Chief Convener **Brain Modes 2017** in Dec 2017, <https://www.brainmodes.org/BrainModes2017/>
- Organized the **Indo-German Medical Imaging conference**, funded by The German House for Research and Innovation – DWIH (Section of German Embassy) and Forschungszentrum Jülich (Germany).
- Coordinated incorporation of Joint Entrance Screening Test (JEST) for admission of Physics/ Theoretical Computer Science students in NBRC. Currently JEST is advertised as entrance in Physics/ Computer Science/ Neuroscience/ Computational Biology because of these efforts.
- Joint co-ordinator of NBRC-IIT Delhi Memorandum of Understanding (MoU) related activities.
- Coordinator MoU with Forschungszentrum Jülich (Germany) for establishing a student and scholar exchange program.
- Organized self and career development workshops in campus.
- Coordinated public outreach of NBRC via **Brain Awareness Week** at Presidency College, Kolkata, 2015.
- Member in several in-house committees such as Admissions, Course Coordination, Student Affairs (Tantrika), Canteen, etc. Hostel Warden for more than 4 years.

E. Functional skills

- 22+ years experience in multivariate time series analysis, signal processing, dynamic model simulations, pattern recognition, machine learning applications, image processing algorithms and concepts, non-linear dynamics, network neuroscience
- 20+ years experience in neurophysiology using EEG
- 15+ years experience in MRI/ MEG
- 22+ years of experience in statistical techniques, both parametric and non-parametric
- 22+ years experience in scientific programming, MATLAB, Mathematica, R, Python, FORTRAN
- 20+ years of experience in writing regulatory documents, e.g. human ethics protocols for collecting patient and healthy volunteer data.
- 12+ years of management of lab, mentoring of PhD, Masters students and Post-doctoral fellows.