Curriculum Vitae

Kausik Kumar Majumdar
Kaushik Majumdar

Personal Detail **PhD (Computer Science)**

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Academic History

B.Sc. (Mathematics) 1990
Calcutta University (India)

M.Sc. (Mathematics) 1996
Annamalai University (India)

M.Tech. (Computer Science) 1999
Indian Statistical Institute

PhD 2003 (Computer Science)
Indian Statistical Institute

Fellowships

1. UGC-CSIR research fellowship and lectureship in Mathematics in 1999 (through all India competition).
2. Selected as a Junior Research Fellow by the Indian Statistical Institute in 1999 (through all India competition).
3. Selected as a Research Associate by the Council of Scientific and Industrial Research in 2003.
4. Offered postdoctoral fellowship by the Institute of Mathematical Sciences, Madras, India in 2004.

5 Got Fulbright Fellowship to visit the University of Memphis as a lecturer/scholar in 2005.
6 Offered a Research Associate position in the Neuroinformatics Center of the University of Oregon at Eugene, Oregon, USA in 2006.
7 Got a position of Invited Scientist in INRIA Sophia Antipolis, France.
8 Offered a position of Project Scientist in the National Brain Research Centre (NBRC), Manesar, Hariyana, India.
9 Offered a postdoctoral position in the University of Toronto (Department of Psychology) from July to September 2008.
10 Offered a postdoctoral position in the Center for Complex Systems and Brain Sciences, Florida Atlantic University, USA, 2008.

PhD Dissertation Title

Some studies on uncertainty management in dynamical systems using fuzzy techniques with applications (Supervisor: Prof. D. Dutta Majumder).

Best Paper Award

- Received Norbert Wiener Outstanding Paper Award jointly with D. Dutta Majumder for the paper "Complexity Analysis, Uncertainty Management and Fuzzy Dynamical Systems: A Cybernetic Approach with Some Case Studies, *Kybernetes* (International Journal of General Systems and Cybernetics), vol. 33(7), pp. 1143 – 1184, 2004.

Other Recognitions

- Fulbright Fellowship in Computer Science during 2005 – 2006 to undertake research in Computational Neurodynamics in Department of Computer Science, University of Memphis, Memphis, TN, USA.
- Senior Member, IEEE since 2010.

Research and Training Grants

- Department of Science and Technology, Government of India grant (2.82 million rupees) under the Cognitive Science Initiative has been awarded in 2010 for the single PI research project titled, "Computation in the brain: neuron, synapse, astrocyte interactions in small networks."
- Indian Statistical Institute grant (1 million rupees) awarded in 2011 for the single PI research project titled, "Human scalp EEG processing during epilepsy and cognition."
- Department of Biotechnology (DBT), Government of India grant (200,000 rupees) for organizing the Indian Neuroinformatics and Computational Neuroscience Summer Course, 4 – 12 June 2012 at Indian Statistical Institute, Bangalore Center (remaining 104,000 rupees was provided by the institute). The program was under the aegis of the Indian chapter of the International Neuroinformatics Coordination Facility (INCF) initiative.
- Department of Biotechnology (DBT), Government of India grant of 2.74 million rupees has been awarded from April 2014 to September 2017 for a project titled, "Quantification of neural information and a subsequent coding scheme."
- Indian Statistical Institute grant (1 million rupees) has been approved for in 2014 – 2016 for the single PI research project titled, "Binary code for the brain."
- Indo-German research grant amounting Rs. 7.3 million has been applied (with Prof. Florian Mormann, Department of Epileptology, University of Bonn) for a project titled,

"Automatic detection of micro-seizures and a study on how they evolve into macro-seizures." Rs. 3830000 has been sanctioned to ISI, the Indian partner, for two years, extendable by one more year.

- Indian Statistical Institute grant (Rs. 460000 sanctioned for the first year) has started from 1st April 2018 and will continue till 31st March 2021 for the single PI research project titled, "Synchronization and desynchronization in a seizure network."

Industrial R&D Position

1. Worked in the Electrical Geodesics Inc. (www.egi.com), as an R&D scientist for seven months.
2. Offered R & D scientist position in the General Motors Research Laboratory in Bangalore in 2006.

Event Organization

- Organized the 1st Brain Science Awareness Workshop on 15th March 2010 in the Indian Statistical Institute, Bangalore Centre.
- Organized the 2nd Brain Science Awareness Workshop on 14 & 15 March 2011 in the Indian Statistical Institute, Bangalore Center.
- Organized Indian Neuroinformatics and Computational Neuroscience Summer Course, 4 – 12 June 2012 in the Indian Statistical Institute, Bangalore Center (with funding from Department of Biotechnology and Indian Statistical Institute).

Research Interests & Goals

- Neural Engineering
  (a) Multivariate and multimodal brain signal processing (EEG, ECoG, MEG, fMRI)
  (b) Cortical rhythms and synchronization during epilepsy, schizophrenia and normal cognition.
  (c) Geometric analysis of time domain signals.
  (d) Cortical codes for information processing and storage.

- Computational Neuroscience
  (a) Detail computational modeling of cortical neurons and networks.
  (b) Learning and memory.
  (c) Working memory.

Research Experiences

1. Junior Research Fellow of Computer & Communication Sciences Division of the Indian Statistical Institute at Calcutta from 30th July, 1999 to 29th July, 2001.
2. Senior Research Fellow of Computer & Communication Sciences Division of Indian Statistical Institute at Calcutta from 30th July, 2001 to 6th November 2003.
3. Research Associate of CSIR working in the Electronics and Communication Sciences Unit from 7th November 2003 to 25th October 2004.
4. Postdoctoral Fellow with the Theoretical Computer Science Group of the Institute of Mathematical Sciences, Chennai from 26th October 2004 to 30th April 2005.
5. Fulbright Visiting Faculty at the Computational Neurodynamics Lab of the Institute for Intelligent Systems under the Department of Computer Science of the University of

Memphis from 3rd May 2005 to 31st January 2006.

6 Scientist in Cerebral Data Systems (a joint venture of the Electrical Geodesics Inc. and the University of Oregon) working on the DARPA funded Neurotechnology for Intelligent Analysts (NIA) project from 1st February 2006 to 31st August 2006.

7 From 1st September 2006 to 30th June 2007 rejoined as a postdoctoral fellow in the Institute of Mathematical Sciences in Chennai, India (under the Fulbright Fellowship condition the US visit was on leave from the institute).

8 From 1st July 2007 to 31st August 2008 working with the ODYSSEE Group at the INRIA, Sophia Antipolis, France as an Invited Scientist.

9 From 1st November 2008 to 1st May 2009 analyzing human scalp EEG signals collected simultaneously from interacting subjects during social coordination at the Center for Complex Systems and Brain Sciences of the Florida Atlantic University, USA.

10 From 4th May 2009 to 31st December 2012 Assistant Professor in the Systems Science and Informatics Unit of the Indian Statistical Institute, Bangalore Center.

11 From 1st January 2013 to 30th November 2018 Associate Professor in the Systems Science and Informatics Unit of the Indian Statistical Institute, Bangalore Center.

12 From 1st December 2018 Professor in Systems Science and Informatics Unit of the Indian Statistical Institute, Bangalore Center.

Administrative Experience

1. Head, Systems Science and Informatics Unit since 1st January 2018.

Invited Lectures

1 A fuzzy dynamical system modeling of evolution of tumor in human tissues, India Research Lab of the IBM, Indian Institute of Technology Campus, New Delhi, 25th May 2004.

2 Separability of human scalp EEG signals during rapid visual target cognition, Department of Biomedical Engineering, Columbia University, New York, 31st July, 2006.

3 Linear discriminants on nonlinear brain waves, Indian Statistical Institute, Calcutta, Electronics & Communication Sciences Unit, 20th October, 2006.

4 Scalp EEG separation during RSVP tasks, 4th national conference of the Indian Society of Sleep Research, Thiruvananthapuram, Kerala, 13 December 2010.

5 Cortical source localization of human scalp EEG, National Conference on Communication 2011, Indian Institute of Science, Bangalore, 28 January 2011.

6 Neuroscience as the base of game theory, International Conference on Game Theory, Operations Research and Their Applications, Indian Statistical Institute, Chennai Center, 5 – 7 January 2012.

7 EEG-based brain computer interfaces, Faculty Development Program in the M. S. Ramaiah Institute of Technology, Bangalore, 27 March 2012.

8 Ubiquitous power and its propagation through networks, Indian Institute of Technology, Jodhpur, 9th May 2012.

9 Synchronization implies seizure or seizure implies synchronization? University of Oldenburg, Germany, 25 July 2012. Also hosted by the university from 16 – 30 July 2012 for research collaboration purposes.

10 Video synchronization in schizophrenia, INCF workshop on “Neuroinformatics of Sensory-Motor Integration: Modeling and Imaging from the Worm to Human Nervous System,” in Chennai in November 5 – 7, 2012 (jointly organized by the IIT-M and IMSc).

11 A new measure of rhythmicity in our brain, in Electronics and Communication Sciences Unit, Indian Statistical Institute, Kolkata, 4 April 2013.
12 Synchronization in epilepsy and schizophrenia, in Infosys Limited, Bangalore, 30 April 2013.
13 Functional brain signal processing: current trends and future directions, in National Conference on Brain and Consciousness, ISI Kolkata, 20 – 21 September, 2013.
14 Ensemble synchronization in schizophrenia, in Electrical Geodesics Inc., Eugene, Oregon, USA, 15 November 2013.
15 Human electroencephalogram: A tutorial, 3rd Bangalore Cognition Workshop, Indian Institute of Science, 8 - 21 December 2013.
16 MAN, the intricate machine – signal and image processing in medical sciences, National Institute of Technology, Surathkal, Karnataka, 30 March 2014 (with G. Chaitanya of NIMHANS).
17 Temporal difference as signal feature extractor, Indo-French Workshop, organized by Indo-French Centre for Applied Mathematics in Indian Institute of Science from 28 to 31 July, 2014.
18 Brain as a dynamical system manifested through epilepsy, Super Computing Education and Research Center (SERC), Indian Institute of Science, 17 – 18 October, 2014.
19 EEG visualization tools, DST-Royal Society Science Seminar 2015, NIMHANS, 7 – 9 March 2015.
20 A novel interpretation of one dimensional time domain signals, Computer and Data Science (formerly Super Computing Education and Research Center) Seminar (inaugural lecture), Indian Institute of Science, 1st April 2016.
21 Cortical rhythms in health and disease in “Thinking Machines in the Physical World,” IEEE 2016 Conference on Norbert Wiener in the 21st Century, National Institute of Advanced Studies, Bangalore, 22 – 23 April 2016.
22 Simultaneity and detectability in neural signals, Department of Epileptology, University of Bonn, Bonn, Germany, 8th June 2017.

Membership

- American Mathematical Society.
- IEEE Senior Member (2010).
- Society for Neuroscience

Teaching Experiences

- Computational Intelligence (COMP 7745-8745, graduate level) of the Department of Computer Science of the University of Memphis in Fall 2005.
- In Fall 2009 taught Foundations of Computers and Information Technology in MS in Library and Information Science in the Indian Statistical Institute Bangalore Center.
- In Spring 2010 teaching Elements of Mathematics II, in MS in Library and Information Science in the Indian Statistical Institute Bangalore Center.
- In Fall 2010 taught Foundations of Computers and Information Technology in MS in Library and Information Science in the Indian Statistical Institute Bangalore Center.
- In Fall 2010 taught Elements of Mathematics I in MS in Library and Information Science in the Indian Statistical Institute Bangalore Center.
- In Spring 2011 taught Data Structures in MS in Library and Information Science in the Indian Statistical Institute Bangalore Center.
- In Spring 2011 taught Elements of Mathematics II in MS in Library and Information Science in the Indian Statistical Institute Bangalore Center.

- In Fall 2013 taught Functional brain signal processing in M.Tech. (CS) program of ISI (Semester III). The course was designed and introduced by myself.
- Took part in curriculum development for Systems Science in Indian Institute of Technology, Jodhpur, Rajasthan in 2011. Designed the curriculum for the compulsory Cognitive Science course for the B.Tech. in Systems Science program.
- An external PhD supervisor in NIMHANS since July 2012 (three co-guided PhD students submitted thesis in NIMHANS, one among them already defended and one more student is still pursuing his PhD).
- Taught as a Guest Faculty a graduate course, "Neural signal processing," in IISc (jointly offered by Department of Electrical Engineering and Center for Neuroscience) along with two other faculties in Spring 2014, 2016 and 2018 (share of teaching load 20%).
- Taught "Functional brain signal processing: EEG & fMRI" as a graduate course to M.Tech. and JRF (Computer Science) students in Fall 2013, 2014, 2015, 2016 and 2017.
- Teaching, "Statistical learning theory," in M.Math. second year during January – May 2019.

Courses Designed

1. Statistical Learning Theory (as an optional paper in M.Math.)
2. Functional brain signal processing: EEG & fMRI (M.Tech. Computer Science, 3rd semester optional paper).

Book

- *A Brief Survey of Quantitative EEG*, Kaushik Majumdar, Taylor & Francis – CRC Press, published on 1st November 2017.

Journal Papers

Neuroscience papers

1. Shannon versus semantic information processing in the brain (advanced review article), K. K. Majumdar, *Wiley Interdisciplinary Reviews in Data Mining and Knowledge Discovery*, 2018 available online at https://onlinelibrary.wiley.com/doi/epdf/10.1002/widm.1284.
2. Machine learning detects EEG microstate alterations in patients living with temporal lobe epilepsy, K. Raj, S. S. Rajagopalan, S. Bhardwaj, R. K. Panda, V. R. Reddam, G. Chaitanya, K. Raghavendra, R. C. Mundlamuri, K. Thennarasu, K. K. Majumdar, P. Satishchandra, S. Sinha and R. D. Bharath, *Seizure*, vol. 61, pp. 8 – 13, 2018.
3. Automatic seizure detection by modified line length and Mahalanobis distance function, A. Pathak, A. Ramesh, A. Mitra and K. K. Majumdar, *Biomedical Signal Processing and Control*, vol. 44, pp. 279 – 287, 2018.
4. A geometric analysis of time series leading to information encoding a new entropy memasure, Kaushik Majumdar and Srinath Jayachandran, *Journal of Computational and Applied Mathematics*, vol. 328, pp. 469 – 484, 2018.
5. NREM Sleep and Anti-epileptic medications modulate epileptiform activity by altering cortical synchrony, C. Nayek, T. Mariappa, K Majumdar, G. S. Ravi, P. D. Prasad, M. Nagappa, K. Thennarasu, A. B. Taly and S. Sinha*, accepted for publication in *Clinical EEG & Neuroscience*, https://doi.org/10.1177/1550059417747436, 2018.
6. Seizure detection and network dynamics of generalized convulsive seizures- towards rational designing of closed-loop neuromodulation, Puneet Dheer, Chaitanya Ganne, Diana Pizarro, Rosana Esteller, Kaushik Majumdar and Sandipan Pati*, *Neuroscience*

Journal, https://doi.org/10.1155/2017/9606213, 2017.
7. Heightened background cortical synchrony in patients with epilepsy during awake and sleep stages – an ensemble phase locking measure based study, C. Nayek, T. Mariappa, K Majumdar, P. D. Prasad, G. S. Ravi, M. Nagappa, K. Thennarasu, A. B. Taly and S. Sinha*, accepted for publication in *Clinical EEG & Neuroscience*, vol. 49(3), pp. 177 – 186, 2018.
8. Phase synchronization analysis of natural wake and sleep states in healthy individuals using a novel ensemble phase synchronization measure, C. Nayak, A. Bhowmik, P. D. Prasad, S. Pati, K. K. Choudhury and K. K. Majumdar, *J. Clin. Neurophysiol.*, vol. 34(1), pp. 77 – 83, 2017.
9. A. Malali, G. Chaitanya, S. Gowda and K. Majumdar, Analysis of cortical rhythms in intracranial EEG by temporal difference operators during epileptic seizures, *Biomedical Signal Processing and Control*, vol. 26, pp. 98 – 108, 2016.
10. A peak synchronization measure for multiple signals, R. Biswas, K. Khamaru and K. K. Majumdar, *IEEE Trans. Signal Processing*, vol. 62(17), pp. 4391 – 4399, 2014.
11. Synchronization implies seizure or seizure implies synchronization?, Kaushik Majumdar, Pradeep D. Prasad, Shailesh Verma, *Brain Topography*, vol. 27(1), pp. 112 – 122, 2014.
12. Single trial EEG classification using logistic regression based on ensemble synchronization, Pradeep D. Prasad, Harsha N. Halahalli, John P. John, Kaushik Majumdar, *IEEE Journal on Biomedical and Health Informatics*, vol. 18(3), pp. 1074 – 1080, 2014.
13. Simultaneous multi-channel peaks and troughs in focal epileptic ECoG is more after offset than during the seizure, Kaushik Majumdar, *Journal of Biomedical Signal Processing and Control* (Elsevier), vol. 10, pp. 58 – 64, 2014.
14. Enhanced phase and amplitude synchronization towards focal seizure offset, P. D. Prasad, S. Vishaka Datta, K. K. Majumdar, *Clinical EEG and Neuroscience* (Sage Publication, USA), vol. 44(1), pp. 16 – 24, 2013.
15. A mathematical model of tripartite synapse: Astrocyte induced synaptic plasticity, Shivendra Tewari and Kaushik Majumdar, *Journal of Biological Physics* (Springer), vol. 38(3), pp. 465 – 496, July 2012.
16. A mathematical model of astrocyte mediated LTP at a single hippocampal synapse, Shivendra Tewari and Kaushik Majumdar, *Journal of Computational Neuroscience* (Springer), vol. 33(2), pp. 341–370, 2012.
17. Differential operator in seizure detection, Kaushik Majumdar, *Computers in Biology and Medicine* (Elsevier), vol. 42(1), pp. 70 – 74, 2012.
18. Human scalp EEG processing: various soft computing approaches, Kaushik Majumdar, *Applied Soft Computing*, vol. 11, pp. 4433 – 4447, 2011.
19. Automatic seizure detection in ECoG by differential operator and windowed varieance, Kaushik Majumdar and Pratap Vardhan, *IEEE Trans. Neural Systems and Rehabilitation Engineering*, vol. 19(4), pp. 356 – 365, August 2011.
20. Constraining the minimum norm inverse by phase synchronization and signal power in the scalp EEG channels, Kaushik Majumdar, *IEEE Trans. Biomedical Eng.* vol. 51(4), pp. 1228-1235, Apr. 2009.
21. Outline of a novel architecture for cortical computation, Kaushik Majumdar, *Cognitive Neurodynamics* (Springer), vol. 2(1), pp. 65 – 77, 2008.
22. A structural and a functional aspect of stable information processing by the brain, Kaushik Majumdar, *Cognitive Neurodynamics* (Springer), vol. 1(4), pp. 295 – 303, 2007.
23. Amplitude suppression and chaos control in epileptic EEG signals, K. Majumdar and M. H. Myers, *Journal of Computational and Mathematical Methods in Medicine* (previously *Journal of Theoretical Medicine*) (Taylor & Francis), vol. 7(1), pp. 53 – 66, 2006.

Dynamical systems papers

24. Fuzzy Knowledge-Based and Model-Based Systems, K. K. Majumdar and D. Dutta Majumder, *Journal of Intelligent & Fuzzy Systems*, vol. 18(4), pp. 391 – 403, 2007.
25. A Study of Fluctuation in Radon Concentration Behaviour, Kaushik Majumdar, *Current Science*, vol. 86(9), pp. 1288 – 1292, 2004.
26. Some Studies on Uncertainty Management in Dynamical Systems Using Cybernetic Approach and Fuzzy Techniques with Applications, K. K. Majumdar and D. Dutta Majumder, *International Journal of Systems Science*, vol. 35(15), pp. 889 – 901, 2004.
27. Fuzzy Differential Inclusions in Atmospheric and Medical Cybernetics, K. K. Majumdar and D. Dutta Majumder, *IEEE Transactions in Systems, Man, and Cybernetics, Part – B: Cybernetics*, vol. 33(4), pp. 877 – 887, 2004.
28. Complexity Analysis, Uncertainty Management and Fuzzy Dynamical Systems: A Cybernetic Approach with Some Case Studies, D. Dutta Majumder and K. K. Majumdar, *Kybernetes* (International Journal of General Systems and Cybernetics), vol. 33(7), pp. 1143 – 1184, 2004.
29. Fuzzy Fractals and Fuzzy Turbulence, K. K. Majumdar, *IEEE Transactions on Systems, Man, and Cybernetics, Part – B: Cybernetics*, vol. 33(1), pp. 746 – 752, 2004.
30. A Mathematical Model of the Nascent Cyclone, K.K. Majumdar, *IEEE Transactions on Geoscience and Remote Sensing*, vol. 41(5), pp. 1118 –1122, 2003.
31. Fuzzy Dynamical Systems Modelling of a Disturbance Leading to Cyclogenesis, K. K. Majumdar, *Journal of Intelligent & Fuzzy Systems*, vol. 13(1), pp. 7 – 15, 2002/2003.
32. One Dimensional Fuzzy Differential Inclusions, K. K. Majumdar, *Journal of Intelligent & Fuzzy Systems*, vol. 13(1), pp. 1 – 5, 2002/2003.
33. A Fuzzy System Modeling of Evolution of Tumor in Human Tissues, K. K. Majumdar and D. Dutta Majumder, *Journal of Intelligent & Fuzzy Systems*, vol. 13(1), pp. 17 – 24 2002/2003.
34. A Mathematical Analysis of Time, K. K. Majumdar, *Science Philosophy Interface*, vol. 5(2), pp. 61– 69, 2000.

Journal Papers under Submission

1. A new causality measure, revision to be resubmitted in *Biometrics* (Wiley), 2018.
2. Time, information and memory, K. K. Majumdar, (submitted), 2018. Also available at http://vixra.org/pdf/1810.0446v1.pdf
3. Enhanced gamma band mutual information is associated with impaired consciousness during temporal lobe seizures, Puneet Dheer, Sandipan Pati, Kalyan Kumar Chowdhury and Kaushik Kumar Majumdar, *Brain Topography*, 2018 (revision resubmitted).

Conference Papers

1. C. S. Nayak, N. Mariappa, G. S. Ravi, P. D. Prasad, **K. K. Majumdar**, K. Tennarasu, A. B. Taly and S. Sinha, "Heightened background cortical synchrony in patients with epilepsy during awake and sleep stages – An ensemble phase locking measure based study," American Epilepsy Society conference 2016, Dec 2 - 6th Houston Texas.
2. G. Chaitanya, R. Panda, R. D. Bharath, **K. K. Majumdar**, S. Zinger, A. Mitra, A. Pathak, K. Raghavendra, C. M. Ravindranadh, K. J. Kumar, J. Rajeshwaran, C. Nagaraj, J. Saini, A. Mahadevan, A. Arima, M. Bhaskar Rao, G. S. Ravi, K. Thennarasu, J. F. A. Jansen, S. Sinha, A. P. Aldenkamp, P. Satishchandra, "Distinct networks of secondary generalization in temporal and extratemporal lobe epilepsy: Evidence from multi-modal graph theory analysis of simultaneous EEG-fMRI," American Epilepsy Society conference 2016, Dec 2 - 6th Houston Texas.
3. D. Pizarro, K. Majumdar and S. Pati, Early detection of focal seizures in thalamus using a novel seizure detection paradigm: towards a closed loop thalamic stimulation, Proc. 32nd Southern Biomedical Engineering Conference (SBEC), USA, 2016, p. 101 – 101.

4. Analysis of brain oscillations by temporal derivatives, Kaushik Majumdar, in Society for Neuroscience (SfN) annual meeting in San Diego, California, 9 – 13, November 2013.
5. A new spike train distance measure, Shubhanshu Shekar and Kaushik Majumdar, accepted for presentation in the International Conference on Data Science and Engineering, Kochin University of Science and Technology, Kerala, 18 – 20 July 2012.
7. Automatic seizure detection in ECoG by DB4 and wavelets and windowed variance : A comparison, Pratap Vardhan and Kaushik Majumdar, Proc. IEEE International Conference on Communication and Signal Processing, pp. 227 – 230, Calicut, Kerala, 10 – 12 February 2011.
8. Scalp EEG separation during RSVP tasks, Kaushik Majumdar and R. M. Frank, Proc. 4th National Conference of Indian Society of Sleep Research, pp. 52 – 63, Thiruvananthapuram, 13 December 2010.
9. Fourier uniformity: An useful tool for analyzing EEG signals with an application to source localization, Kaushik Majumdar, accepted for oral presentation in *IJCNN'09*, available at http://arxiv.org/ftp/arxiv/papers/0904/0904.4499.pdf.
10. A Mathematical Model of Corruption, K. K. Majumdar, International Conference on Knowledge Engineering, Las Vegas, USA, July 2003.
11. A Mathematical Model of Nascent Cyclone, IGARSS'02, Toronto, Canada, September 2002.
12. Fuzzy – Another Paradigm to Tackle Complexity, K. K. Majumdar, FUZZ-IEEE, Melbourne, Australia, December 2002.
13. Generalized Fuzzy Vector Space, K. K. Majumdar, Asian Fuzzy Systems Symposium, Tsukuba, Japan, 31 May 2000 – 3 June 2000, pp. 239 – 243.

Referring Activities

1. Reviewed papers for *Optical Society of America, IEEE Transactions on Biomedical Engineering, IEEE Transactions on Medical Imaging, Biomedical Signal Processing and Control (Elsevier), Neurocomputing, Brain and Cognition, Applied Soft Computing, Clinical EEG and Neuroscience, Journal of Computational and Applied Mathematics, IEEE Transactions on Biomedical Imaging, Journal of Optical Society of America, Frontiers of Computational Neuroscience, ACM Transactions on Embedded Computing Systems*. In the past I also reviewed for *Journal of Intelligent and Fuzzy Systems*, *IEEE Transactions on Fuzzy Systems*, *Fuzzy Sets and Systems* (Elsevier Science), *ICAPR'03*, *AFSS'04*.
2. Research grant application reviewer for the Department of Biotechnology, Government of India.
3. Research grant application reviewer for Natural Science and Engineering Research Council (NSERC), Canada.
4. Past member of Conference/Meeting/Workshop grant review committee of the Department of Biotechnology, Government of India.
5. Research grant application reviewer for Science and Engineering Research Board (SERB), Department of Science and Technology, Government of India.

Bachelor/Masters Students Guided

1. Pratap Vardhan, BE, Electronics & Communication Engineering, National Institute of Technology, Bhopal, India (undergraduate intern), 2009 – 2010.
2. Binit Kiran, MS, Library and Information Science, Indian Statistical Institute, Bangalore Centre (master's thesis), 2009 – 2010.
3. Shailesh Verma, MS, Library and Information Science, Indian Statistical Institute, Bangalore Center (master's thesis), 2011 – 2012 (Now in Jawaharlal Nehru University, New Delhi).
4. S. Vishaka Datta, Integrated M.Sc. in Statistics and Informatics, Indian Institute of

Technology, Kharagpur under the KVPY fellowship, 2010. (Pursuing PhD in NCBS, Bangalore).
5. Aniruddh Galgoli, Electrical Engineering, NIT Sutathkal, 2011. Pursuing PhD in University of Southern California, Los Angeles.
6. Subhanshu Sekhar, Electrical Engineering, IIT Kharagpur, 2011. Pursuing PhD in University of California, San Diego.
7. Rahul Biswas, Bachelor of Statistics (B.Stat.), Indian Statistical Institute, Kolkata, 2013 (under Inspire fellowship, now in PhD program in Statistics in University of Washington, Seattle).
8. Koulik Khamaru, Bachelor of Statistics (B.Stat.), Indian Statistical Institute, Kolkata, 2013 (under KVPY fellowship, now in PhD program in Statistics in University of California at Berkeley).
9. Abhishek Malali, B.Tech. (Electronics & Communication), NIT Surathkal, 2013-2014, (officially guided undergraduate thesis) (now pursuing PhD in Harvard).
10. Shashi Gowda, B.Tech. (Information Technology), NIT Surathkal, 2013-2014 (now pursuing PhD in Applied Mathematics in MIT).
11. Aditya Ramesh, B.Tech. (Electrical and Electronics), NIT Surathkal, 2015-2016 (now pursuing PhD in Swiss AI Lab IDISA).
12. Mrinalini Ranjan, B.Tech. (Avionics), Indian Institute of Space Science and Technology, Thiruvananthapuram, 2017-2018.
13. Abhilash Kurmi, M.Tech. (Computer Science), Indian Statistical Institute, Kolkata (M.Tech. thesis), 2016–2018 (left M.Tech. unfinished).
14. Keyur Pethad, M.Math. (2017–2019) Indian Statistical Institute, Bangalore Center, M.Math. project.

Postdoctoral Fellows

1. Neelam Sinha (PhD, IISc, currently Assistant Professor, IIIT Bangalore)
2. Shivendra Tewari (PhD, NIT, Bhopal, currently Scientist II, DoD Biotechnology HPC Software Applications Institute, US Army Medical Research and Material Command, Frederick, MD, USA).
3. Subhra Patra (PhD, Homi Bhaba University, currently Assistant Professor in Amrita University).

PhD Students

1. Anupa A. V. (ME, Biomedical Engineering, SRM University, Tamil Nadu, thesis defended in NIMHANS on 18 August 2016, jointly supervised with Prof. John P. John of National Institute of Mental Health and Neuro Science (NIMHANS)). Thesis title, “Multimodal brain image analyses aimed at integration of neuro-chemical, physiological and anatomical aberration in schizophrenia. Now she is in Sree Chitra Tirunal Institute for Medical Science and Technology, Trivandrum as a National Postdoctoral Fellow.
2. Chaitanya, G. (MBBS, ICMR Fellow, NIMAHNS, Bangalore, thesis defended in NIMHANS on 11 March 2017, jointly supervised with Prof. P. Satishchandra, NIMHANS). Thesis title, ”Simultaneous EEG fMRI to study the patterns of phase synchronization and functional connectivity in symptomatic localization related epilepsy.” Now he is a postdoctoral fellow in Department of Neurology, Thomas Jefferson University, Philadelphia, PA, USA.
3. Chetan Nayak (MBBS, ICMR Fellow, NIMHANS, Bangalore, thesis defended in NIMHANS on 7 April 2017, jointly supervised with Prof. Sanjib Sinha of NIMHANS). Thesis title, "Macro and microstructural video-polysomnographic signal analysis: sleep and epilepsy correlation." Now he is in Cleveland Clinic, Cleveland, OH, USA as a postdoctoral fellow.
4. Pravesh Parekh, (ME, Amity University, jointly being supervised with Prof. John P. John

in NIMHANS).

Past Senior Research Fellows (project linked)

1. Mohammed Tarique (M. Tech. (CS), ISI)
2. Gyanendra Tripathi (M. Tech. (Electronics), BIT Nainital)
3. Ramesh Perumal (ME, Embedded Systems, Manipal University)
4. Subhajit Bhowmik (M.Tech., West Bengal University of Technology)
5. Srinath Jayachandran (M.Tech. (Computer Science, SRM University, Chennai))
6. Puneet Dheer (M.Tech. (Computer Science, SRM University, Chennai))

Past Junior Research Fellows (project linked)

1. Anagh Pathak (B.Tech. in Chemical Engineering and M.Sc. in Physics from BITS Pilani Campus). Currently he is in Cognitive Science PhD program in National Brain Research Center, Masesar, Haryana.
2. Yash Vokilna (B.Tech. in Electrical Engineering and M.Sc. in Biology from BITS Pilani Campus). Currently he is in Biomedical Engineering PhD program in University of California, Irvine, CA, USA.
3. Viswadeep Sarangi, (B.Tech. in Instrumentation Engineering and M.Sc. in Physics from BITS Pilani Campus). Currently in joint PhD program between University of York and Cambridge University in UK.
4. Praveen Kumar (M.Tech. (Embedded Systems, Manipal University)), currently pursuing PhD in IIT Palakkad, Kerala.

Project Linked Personnel

5. Pradeep D. Prasad (B. Tech., Electronics & Communication Engineering, NIT, Trichy)
6. Sonal Sharma (M.Tech., Information Technology, C-DAC, Noida)
7. Anupam Mitra (B.Tech. in Computer Science and M.Sc. in Physics from BITS Goa Campus). Currently he is in PhD program in University of New Mexico, Albuquerque, NM, USA.

Current Project Linked Personnel

1. Puneet Dheer (M.Tech. (Computer Science, SRM University, Chennai))

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1. An investigation into the vortex formation in a turbulent fluid with an application in tropical storm generation, Kaushik Majumdar, arxiv.org/abs/nlin.CD/0310045, 2003.
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