Curriculum Vitae

current version

Abhranil Das · abhranil.net · abhranil@abhranil.net
vision science · computational neuroscience · psychedelic science

now · PhD student, Physics · Geisler lab · Center for Theoretical & Computational Neuroscience · The University of Texas at Austin

2008-2013 · Bachelor & Master of Science in Physics · Indian Institute of Science Education and Research, Kolkata

Research and publications · Google Scholar

Understanding camouflage detection · Abhranil Das & Wilson Geisler (ongoing)

- 2020 · Vision Sciences Society (VSS) conference
- 2018 · VSS conference (talk)
- 2018 · Computational and Systems Neuroscience (COSYNE) conference

A method to integrate and classify normal distributions · Abhranil Das & Wilson Geisler

- 2021 · Journal of Vision (cover article) · arXiv
- 2019 · Vision Sciences Society (VSS) annual conference

Systematic errors in connectivity inferred from activity in strongly recurrent networks · Abhranil Das & Ila Fiete

- 2020 · Nature Neuroscience · bioRxiv
- 2017 · Austin Conference on Learning and Memory
- 2016 · Gordon Research Conference: Neural circuits for perception, memory, thought and consciousness
- 2016 · Natural Environments, Tasks and Intelligence conference
- 2016 · COSYNE conference

2017 · Visual texture classification and synthesis using a variational autoencoder · talk and python workshop at the Junior Scientist Workshop on Machine Learning and Computer Vision at Janelia Research Campus

Transient dynamics in the thermal ratchets transport model · Abhranil Das & Soumitro Banerjee, IISER Kolkata

- 2015 · arXiv
- 2013 · The thermal ratchets model for transport of diffusive particles (Masters thesis)

2011 · Process time comparison between GPU and CPU · Abhranil Das & Robi Banerjee, University of Hamburg

2010 · Perspective: the maths of seeing (book) · Lambert Academic Publishing, Germany

I wrote this book from high school through freshman year, on mathematical models of visual perspective projection, their applications in graphing projections of common 3D objects, and the mathematical theory of binocular visual projection. It is available through all major outlets like Amazon.

Programming · Full developer profile · Github profile · Arctic code vault contributor

2021 · Center for Theoretical and Computational Neuroscience website · open source

2021 · Integrate and Classify Normal Distributions · Matlab toolbox · open source

Integrate multinormal distributions in any dimensions with any parameters in any domain, compute pdf/cdf/inverse cdf of any function of a normal vector, and measures of classification performance among two or more multinormals, such as error matrix and sensitivity index.

2021 · Generalized chi-square distribution · Matlab toolbox · open source

Compute the statistics, pdf, cdf, inverse cdf and random numbers of the generalized chi-square distribution.

2015-16 · Particle image velocimetry, comparison with numerics, and analysis · open source Matlab code

For the experimental study of internal waves in Dr Harry Swinney's fluid dynamics group at UT Austin.

Career highlights, teaching, outreach

2020-now · The Room of Lives podcast · I showcase lives and perspectives in conversations that touch on science, learning, spirituality and psychedelics · 58 episodes with 24 guests so far

2019 · Taught meditation and UT-accredited math courses at Lockhart Women's prison, as part of Texas Prison Education Initiative

2018 · Invited talk at Trinity University: 'Making Sense of the Brain with Physics'

2017-18 · Co-hosted KVRX 91.7 FM show 'They Blinded Me with Science', that showcased grad student research

2015-19 · Organized Molotov Seminar (104 talks by 89 speakers), a weekly series of open talks by anyone, for anyone, on anything, at UT Austin · News coverage articles 1, 2, 3

2015-16 · As Assistant Instructor at UT, I designed and taught my own undergrad electromagnetism course. As Head Teaching Assistant of engineering physics lab, I instructed and oversaw all other graduate TA's.

2013 · Received the IISER Kolkata Gold Medal of Excellence from state governor M.K. Narayanan, for overall academics and extracurriculars during my integrated Bachelors and Masters.

2011-12 · Elected Deutscher Akademischer AaustauschDienst (DAAD) Young Ambassador to India by the German Academic Exchange Service in 2011, and re-elected in 2012. I promoted German education programs and fellowships in India by writing for online newspapers, organizing seminars, and guiding applicants on scholarships, programs and VISA questions.

2008-9 · Received the C.N.R. Rao Foundation Prize for achieving institute rank 1 in both semesters 1 and 2 at IISER Kolkata.

Projects

2017 · Used a variational autoencoder for unsupervised latent variable extraction from mouse head-direction cell population recordings, with Dr Ila Fiete, dept. of Neuroscience, UT Austin.

2012 · Analyzed data from galactic neutral hydrogen (HI) radio sources acquired by the Giant Metrewave Radio Telescope, with Dr Subhashis Roy at the National Centre for Radio Astrophysics, India.

2012 · Invited as coordinator and instructor for the NCRA-IUCAA Radio Astronomy Winter School for College and University Students in India, in which position I coordinated experiments and delivered a lecture.

2011 · Received the DAAD (German Academic Exchange Service) scholarship for a summer research project on Process time comparison between CPU and GPU using CUDA for parallel computing on NVIDIA GPU's, with Dr Robi Banerjee's numerical astrophysics group at the University of Hamburg.

2010 · Radio Astronomy Winter School, National Centre for Radio Astrophysics & Inter-University Centre for Astronomy and Astrophysics, India. Voted the best among seven teams in experiments, seminar and poster presentation.

Research and outreach talks

2017 · Unsupervised latent variable extraction from head-direction cells using a variational autoencoder

2016 · Noise correlations in neural systems

2015, 2013, 2012 · Telling right from left: the misleading handedness of electrodynamics

2012 · Web Design: HTML · CSS · Javascript

2012 · Diffusion-limited aggregation

2011 · Stochastic neural network model: part 1 · part 2 · MATLAB simulation report

2009 · DNA double helix: a mathematical approach to the physical structure

2008 · Cellular Automata

Technical articles

2017 · Depth estimation from stereo image pairs using block-matching (with MATLAB code)

2015 · Lyapunov exponent of the logistic map (with Mathematica code)

2015 · Training neural networks with genetic algorithms

2014 · Calculating the Lyapunov exponent of a time series (with python code)

2014 · R code for multivariate random-walk Metropolis sampling

2014 · Partners meet halfway: a simple correlation study of an undergrad lab class

2013 · A/B and Rh antigens in blood types: a statistical test of independence among IISER Kolkata students

2012 · Locating numbers inside bisected interval sequences

2011 · Simulating evolution and behaviour

References

Dr Wilson Geisler · PhD advisor · Center for Theoretical & Computational Neuroscience, UT Austin · w.geisler@utexas.edu

Dr Soumitro Banerjee · Masters thesis advisor · depts. of mathematics & physics, IISER Kolkata · soumitro@iiserkol.ac.in