Curriculum Vitae

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

now · PostDoc · Geisler vision lab · Center for Theoretical & Computational Neuroscience · The University of Texas at Austin

2013-22 · PhD, Physics · Geisler vision lab · The University of Texas at Austin

2008-13 · BS-MS, Physics · Indian Institute of Science Education and Research, Kolkata

Research highlights · Google Scholar · ResearchGate

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

Vision Sciences Society (VSS) conference: 2022, 2020, 2018 (talk)

2022 · PhD Thesis · ResearchGate

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 · VSS 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 · 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 my first undergrad year, on mathematical/computational models of perspective projection in vision.

Programming · Github · Arctic code vault contributor

2022 · Trace Contours · open source · Trace sequential pixel coordinates of all contours in a binary image.

2022 · Colored Noise · open source · Generate power-law coloured noise signals of any dimensions.

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

2021 · Integrate and Classify Normal Distributions · 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 · 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

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 people's lives and perspectives in conversations that touch on science, spirituality and mind · 93 episodes with 40 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 · IISER Kolkata Gold Medal of Excellence from state governor M.K. Narayanan, for academics and extracurriculars during BS-MS.

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 · Invited as instructor for the National Centre for Radio Astrophysics & Inter-University Centre for Astronomy and Astrophysics Radio Astronomy Winter School in India. I coordinated experiments, gave a talk, and analyzed galactic neutral hydrogen data from the Giant Metrewave Radio Telescope, with Dr Subhashis Roy.

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 · NCRA-IUCAA Radio Astronomy Winter School, India. Voted best of seven teams in experiments, seminar and poster.

Research and outreach talks

2022 · Open your Science and be More Seen · Big Data in Neuroscience Workshop, Advanced Computational Neuroscience Network

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

2016 · Noise correlations in neural systems

2015, 13, 12 · 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 · Matlab code

2015 · Training neural networks with genetic algorithms (R)

2014-15 · Calculating the Lyapunov exponent of: time series (python) · logistic map (Mathematica)

2014 · Multivariate random-walk Metropolis sampling (R)

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 (python)

2011 · Simulating evolution and behaviour (python)

References

Dr Wilson Geisler · PhD & PostDoc 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