Curriculum Vitae

links in blue · current version

Abhranil Das · abhranil.net · abhranil.das@utexas.edu

Academic position

- now · Geisler vision lab · Center for Perceptual Systems · PhD student, Physics · The University of Texas at Austin
- 2008-2013 · Integrated BS & MS in Physics, Indian Institute of Science Education and Research, Kolkata

Research and publications · Google Scholar

- Understanding camouflage detection · Abhranil Das & Wilson Geisler (ongoing)
  - 2020 · VSS annual conference
  - 2018 · VSS annual conference · talk
  - 2018 · Computational and Systems Neuroscience (COSYNE) conference
- A method to integrate and classify normal distributions · Abhranil Das & Wilson Geisler
  - 2020 · 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** · bioRrXiv
  - 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 · Lambert Academic Publishing, Germany.

  From high school until the end of my first undergraduate year, I wrote a book on mathematical models of perspective projection in vision, their applications in plotting projections of common 3D objects, and the mathematical theory of binocular vision. It is available through all major outlets like Amazon.

Programming · Full developer profile · Github 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 normal 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, like error matrix and d'.
- 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.

Career highlights, teaching, outreach

- 2020-now · The Room of Lives podcast · I explore the lives and perspectives of people 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 TPEI.
- 2017-18 · Co-hosted KVRX 91.7 FM show 'They Blinded Me with Science', that showcased grad student research.
- 2018 · Invited talk at Trinity University: 'Making Sense of the Brain with Physics'.
- 2015-16 · As Assistant Instructor, I designed and taught my own undergrad electromagnetism course. And as Head Teaching Assistant of engineering physics lab at UT Austin, I oversaw all other graduate TA's.

- 2015-19 · Organized Molotov Seminar, a weekly series of open talks by anyone, for anyone, on anything, at UT Austin · 104 talks by 89 speakers · The Daily Texan articles 1, 2, 3.
- 2013 · Received the **IISER Kolkata Gold Medal of Excellence** from governor of state M.K. Narayanan, for overall institute academics and extracurriculars during my integrated Bachelors and Masters.
- 2011-12 · Elected DAAD Young Ambassador to India by the German Academic Exchange Service in 2011, and re-elected in 2012. In this position 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 Fellowship 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.
- 2015-16 · Experimental study of internal waves in Dr Harry Swinney's fluid dynamics group at UT Austin. I wrote open-source MATLAB code for particle image velocimetry, comparison with numerics and analysis.
- 2012 · Analyzed data from galactic neutral hydrogen (H1) radio sources acquired by the Giant Metrewave Radio Telescope (GMRT), under Dr. Subhashis Roy at the National Centre for Radio Astrophysics (NCRA-TIFR), 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, Germany**.
- 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.

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 Perceptual Systems, UT Austin · w.geisler@utexas.edu
- Dr Ila Fiete · research advisor · Brain and Cognitive Sciences, MIT · fiete@mit.edu
- Dr Soumitro Banerjee · Masters thesis advisor · depts. of mathematics & physics, IISER-K · soumitro@iiserkol.ac.in