

Curriculum Vitae

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physics · vision science · computational neuroscience · psychedelics

2022-now · PostDoc · [Geisler vision lab](#) · [Center for Theoretical & Computational Neuroscience](#) · The University of Texas at Austin

2022-now · Researcher · [Fonzo lab](#) · [Center for Psychedelic Research & Therapy](#) · The University of Texas at Austin

2013-22 · PhD, Physics · [Geisler 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](#)

current · Understanding camouflage detection · [PhD Thesis](#) · Vision Sciences Society (VSS) conference 2025 (talk), [2022](#), [2020](#), [2018](#) (talk) · Computational and Systems Neuroscience (COSYNE) conference 2018

current · Self-supervised models of texture discrimination · [VSS 2024](#)

2022-current · Measuring psychedelic treatment with eye-tracking · UT Austin Annual Psychology Graduate Research Showcase 2024: [poster](#) & [talk](#) · [Roots alumni meet 2025](#), [IISER-K](#) · [podcast](#)

2025 · Ecological trauma in the collective psyche: a psychedelic, transpersonal, and non-dual view · [Ecopsychology](#) (accepted)

2025 · [New methods to compute the generalized chi-square distribution](#) · [Journal of Statistical Computation & Simulation](#) (accepted)

2021 · A method to integrate and classify normal distributions · [Journal of Vision](#) (cover article) · [arXiv](#) · [VSS conference](#)

2020 · Systematic errors in inferring strongly recurrent circuits from activity · [Nature Neuroscience](#) · [Austin Conference on Learning and Memory](#) · [Gordon Research Conference: Neural circuits for perception, memory, thought and consciousness](#) · [COSYNE conference](#)

2017 · Applying a variational autoencoder:

- for visual texture classification and synthesis · [Junior Scientist Workshop on Machine Learning and Computer Vision](#), [Janelia Research Campus](#) · I presented a talk and coordinated an interactive python workshop.

- for unsupervised latent variable extraction from mouse head-direction cell population recordings · with Dr Ila Fiete, dept. of Neuroscience, UT Austin · [talk](#)

2015 · Transient dynamics in the thermal ratchets transport model · [arXiv](#) · [MS thesis](#)

2011 · [Process time comparison between GPU and CPU](#) · with [Dr Robi Banerjee](#), University of Hamburg · with the [DAAD \(German Academic Exchange Service\) scholarship](#) · I benchmarked the use of CUDA for parallel computing on NVIDIA GPU's, for numerical astrophysics.

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.

Coding highlights · [Github](#) · [Arctic code vault contributor](#)

2023 · [Orientation Stats](#) · [open source](#) · compute mean and sd of orientations with correct angle-wrapping.

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 distribution.

2015-16 · Particle image velocimetry · [open source](#) · for the experimental study of [internal waves](#) in [Dr Harry Swinney's](#) fluid dynamics group.

Career highlights, teaching, outreach

- 2020-now · [The Room of Lives podcast](#) · conversations with people on science, spirituality, mind and mystery · 131 episodes with 67 guests so far
- 2024, 23, 21 · [Taught UT Austin Neuroscience boot camp](#) · taught workshops on Matlab and signal detection theory to incoming grad students.
- 2019 · [Texas Prison Education Initiative](#) · Taught meditation and UT-accredited math courses at Lockhart Women's prison
- 2018 · [Invited talk at Trinity University: 'Making Sense of the Brain with Physics'](#)
- 2017-18 · [Radio show host](#) · co-hosted UT student-run 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 · [Assistant Instructor and Head Teaching Assistant, UT Austin](#) · as Assistant Instructor, I taught an 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.
- 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](#).
- 2011-12 · [DAAD \(German Academic Exchange Service\) Young Ambassador to India](#) · elected in 2011, re-elected in 2012. I promoted German education programs and scholarships by writing online, organizing seminars, and helped applicants with scholarship, program and visa questions.
- 2010 · [NCRA-IUCAA Radio Astronomy Winter School, India](#) · voted best of seven teams in experiments, seminar and poster.
- 2008-9 · Received the [C.N.R. Rao Foundation Prize for achieving institute rank 1](#) in both semesters 1 and 2 at IISER Kolkata.

Talks

- 2022 · [Open your Science and be More Seen · Big Data in Neuroscience Workshop](#)
- 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](#)
- 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 · [Chaos in the brain \(Matlab\)](#)
- 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 Greg Fonzo](#) · research supervisor · Center for Psychedelic Research & Therapy, UT Austin · gfonzo@austin.utexas.edu
- [Dr Soumitro Banerjee](#) · Masters thesis advisor · depts. of mathematics & physics, IISER Kolkata · soumitro@iiserkol.ac.in