Dinesh **Natesan**, PhD

RESEARCHER · ENGINEER · NEUROSCIENTIST

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Summary

Researcher with 10+ years of experience in neuroscience, computational biology, and data science. Passionate about working on important problems that can produce large impact (co-founded startup to build power-efficient AI hardware; built novel VR to unravel neural circuits of insect navigation). Curious about many fields of science, with a drive for learning, growth, and impact.

Experience

Researcher, CONSULTANT — Sep. 2026 - present

- Consulting researcher @ UCSB: research projects (project management, data analysis), writing research findings as scientific articles.
- Contributor @ GIEF: conceived, researched, and wrote a research report on broad implications of a broken academic system.

Postdoctoral Researcher, UNIVERSITY OF CALIFORNIA, SANTA BARBARA — Nov. 2021 - Aug. 2026

- Led independent research across three distinct areas by pinpointing knowledge gaps, defining project scopes, and driving execution:
  - *Polarization-based navigation:* built sky-polarization models from Rayleigh-scattering data to simulate fly vision, extracted circuit motifs from the fly connectome, used probabilistic programming to fit models, and predicted neural circuit computations.
  - *Color-based navigation:* designed a fly-centric VR arena with full-spectrum (UV–blue–green) lighting, converted natural RGB scenes to UV–B–G using generative AI models (CANs), built a Unity-based backend, and performed behavior and imaging experiments.
  - *Heading representation in flying flies:* conceived, designed, and built a two-photon microscope for recording neural activity in freely yawing flies; developed custom software for rapid volumetric acquisition and performed novel physiological experiments.
- Project management: de-risked projects through collaboration, built multidisciplinary teams, scoped sub-projects, and drove progress.
- Mentorship: recruited three undergrads via campus ads, delegated low-risk sub-projects, and guided them to successful completion.
- Technical skills: Python (NumPy, Pandas, SciPy, scikit-learn, JAX, PyTorch, PyMC, Matplotlib), MATLAB, Autodesk Inventor, LabVIEW

Co-founder and CEO, LIGHTSPEEDAI LABS — Mar. 2019 - Apr. 2020

- Vision: developed the key idea inspired by my neuroscience experience, attracted a co-founder, and shaped the vision for the startup.
- Validation: defined the MVP, distilled it into a seed round PoC, and devised computation methods to evaluate viable hardware options.
- Fundraising: pitched idea to major VC audiences (video), held talks with 20+ investors, and mapped key players for our seed round.

Graduate Student, NCBS, BANGALORE & KTH, STOCKHOLM — Sep. 2012 - Sep. 2020

- Led independent research in multidisciplinary areas, contributed to collaborative projects, and advanced project progress.
  - *Tuneable reflexes (thesis focus):* conceived the core concept, designed and executed experiments, collected data, and developed analysis pipelines using custom hardware/software. Leveraged the data to build control theoretic and neural network models. Working outside my supervisors' expertise taught me to generate ideas, establish collaborations, and obtain timely feedback.
  - *Olfactory search (collaborative project):* co-designed experiments, built image processing pipelines, filtered data with signal processing, computationally modeled localization, and leveraged statistical inference to reveal the algorithmic basis of behavior.
- Collaboration & mentorship: partnered with peers on several projects and mentored an undergraduate to finish a sub-project.
- Technical skills: MATLAB (toolboxes: data acquisition, image processing, signal processing, control theory, statistics) and Python (NEST).

Research Fellow, NCBS, BANGALORE — Sep. 2011 - Aug. 2012

- Investigated housefly flight kinematics: recorded wing and body motion with high-speed cameras, reconstructed 3D coordinates via direct-linear-transformation, applied cross-correlation and statistical tests to identify the wing movements that provide flight control.

Skills

Multidisciplinary Research **Proficient:** Neuroscience, Computer & Data Science, Electronics, **Familiar:** ML/AI, Mechanics, Optics
Programming **Proficient:** Python, MATLAB, **Familiar:** R, C/C++/Embedded C, LaTeX
Data Science NumPy, Pandas, SciPy, scikit-learn, JAX, PyTorch, PyMC, OpenCV-Python, Jupyter, Matplotlib, seaborn
Prototyping Autodesk Inventor, OpenSCAD, KiCAD, Simulink, LabVIEW
Problem-Solving Skilled at troubleshooting, brainstorming ideas, evaluating and de-risking them to generate viable solutions (5 projects)
Collaboration Proficient at initiating collaborations and forming teams to de-risk ideas (formed teams for 4 projects)
Leadership Managed interdisciplinary team; mentored 3 undergrads; organized 5 workshops; established vision, fundraising path for startup
Communication Wrote scientific articles (3+), outreach/blog posts, gave fundraising talks and public research talks (1 per quarter)

Education

Doctorate in Life Sciences and Computer Science — Sep. 2012 - Dec. 2020

National Centre for Biological Sciences (NCBS) & KTH Royal Institute of Technology

In addition to independent research, took advanced courses and workshops in neuroscience and computer science: neurobiology, neurothology, mathematical modeling of biological systems, probabilistic inference theories of neural computation, non-linear dynamics, information theory, machine learning.

Master of Science (Honors) in Biological Sciences — Sep. 2006 - Aug. 2011

Birla Institute of Technology and Science (BITS), Pilani

Took biology courses and completed two research projects. Obtained research experience in neuroscience and neuroethology through an internship at NCBS.

Bachelor of Engineering (Honors) in Electrical and Electronics Engineering Sep. 2006 - Aug. 2011

Birla Institute of Technology and Science (BITS), Pilani

Took courses in electronics, computer science (focus: signal processing and control theory). Developed firmware during internship at Texas Instruments.

Publications

2020 **Neuromechanical basis of airflow-dependent antennal positioning in hawkmoths** PhD Thesis

Dinesh Natesan

ISBN: 978-91-7873-697-3

2019 **Tuneable reflexes control antennal positioning in flying hawkmoths** Nat. Commun.

Dinesh Natesan, Nitesh Saxena, Örjan Ekeberg, and Sanjay P. Sane

DOI:10.1038/S41467-019-13595-3 | DATA | ANALYSIS | COMPUTER VISION

2018 **Odor source localization in complex visual environments by fruit flies** J. Exp. Biol.

Nitesh Saxena*, Dinesh Natesan*, and Sanjay P. Sane

DOI:10.1242/JEB.172023 | ANALYSIS *EQUAL CONTRIBUTION

Professional Development

2026 **NeuroDataRehack 2026**, Janelia Research Campus *Ashburn, VA*

2025 **High-Impact Career Pivot Bootcamp**, Center for Effective Altruism (CEA) *Virtual*

2025 **Introduction to Effective Altruism Course**, Center for Effective Altruism (CEA) *Virtual*

2025 **Impact Accelerator Program (IAP)**, High Impact Professionals (HIP) *Virtual*

2025 **Academic Lab Management and Leadership Symposium**, Torrey Pines Training Consortium *Virtual*

2023 **Neural Data Science**, Cold Spring Harbor Laboratory (two-week full-time course on big data neuroscience) *New York*

2023 **Promoting Postdoc Progress**, University of California, Santa Barbara (six-week program on thriving as a postdoc) *Santa Barbara*

2020 **Junior Scientist Workshop on Mechanistic Cognitive Neuroscience**, HHMI Janelia Research Campus *Virtual*

2016 **Okinawa Computational Neuroscience Course (OCNC)**, Okinawa Institute of Science and Technology *Okinawa*

Professional Activities

2020-26 **Reviewer/Co-reviewer**, J. Exp. Biol., Curr. Biol., PLOS Comput. Biol., Neuron, Nature, Nat. Comm. (4/yr) *reviewed: 27*

2025 **Module Co-instructor**, KITP Quantitative Biology Summer Program (guided experiment design and analysis) *UCSB*

2025 **Teaching Assistant**, Drosophila Neurobiology (taught basics of analyzing two-photon imaging data) *CSHL*

2024 **Judge**, iGEM Grand Jamboree (synthetic biology competition) *Virtual*

2024 **Co-organizer**, This Postdoc Life (postdoc talk series for cross-pollination & community-building) *UCSB*

2023 **Co-organizer**, Cultivating a Healthy and Productive Lab (talk series) *eLife, Virtual*

2018 **Co-organizer**, Probability, Statistics, and Linear Algebra Workshop *NCBS*

2017 **Co-organizer**, Programming Workshop *NCBS*

2016-19 **Co-organizer**, Machine Learning Journal Club *NCBS*

Honors & Awards

2025 **Board member**, eLife Sciences Publications (one of five members, declined position due to visa constraints) *Remote*

2022-24 **Ambassador**, eLife Sciences Publications (co-organized a talk series on cultivating a healthy research lab) *Remote*

2019 **Founder**, Entrepreneur First (EF) (12-week full-time program, received seed investment for startup) *Bangalore*

2017 **Best Poster Award**, Annual Talks Symposium, NCBS *Bangalore*

2016 **SICB Student Journalism Program**, Society for Integrative and Comparative Biology *Portland, OR*

2012 **Erasmus Mundus Doctoral Scholarship**, EuroSPIN Joint Doctoral Program (PhD fellowship)

Science Outreach

2026 **Research Report**, How a Broken Science System Threatens Democratic Governance *GIEF*

2026 **Essay**, Reimagining scientific publishing *Google docs*

2026 **Forum post**, Agriculture needs another revolution *lesswrong*

2026 **Forum post**, Rethinking application feedback *Effective Altruism*

2024-26 **Digital Garden**, Umwelt *Self-hosted*

2022 **Research Highlight**, A persistent behavioral state enables sustained predation of humans by mosquitoes *preLights*

2021 **Research Highlight**, NeuroMechFly, a neuromechanical model of adult Drosophila melanogaster *preLights*

2021 **Opinion**, Science and the art of relentless questioning *ScienceOut*