

Ishita Dasgupta

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Academic CV

AI researcher with 5+ years of experience in statistics, deep learning, and cognitive science seeking industry positions in research, applied machine learning, and data science.



EDUCATION

Harvard University, Ph.D. in Physics. GPA: 4.0/4.0. Transcript [here](#), thesis précis [here](#). March 2020
Indian Institute of Technology Bombay, B.Tech. in Engineering Physics. GPA: 9.61/10. August 2014

PROFESSIONAL EXPERIENCE

Princeton University. Postdoctoral Fellow, Dept. of Computer Science. Supervisor: Prof. Tom Griffiths. 2020–present

- Researched the complexity of learning and representation in human and artificial intelligence.
- Supervised 3 graduate and undergraduate researchers, on projects in machine learning and **Bayesian statistics**.

Harvard University. Graduate Researcher, Dept. of Physics. Supervisor: Prof. Sam Gershman. 2015–2019
9 articles in peer-reviewed journals and conferences (8 published, 1 under review). Details on [Google Scholar](#).
4 academic awards (3 described in the Selected Awards section).

- Formalized the computational complexity of information processing in the brain using tools from machine learning.
- Built new models of human learning and decision-making that incorporate these insights, using **Python** and **R**.
- Tested model predictions by running interactive online experiments on Amazon **MTurk**, using HTML and JavaScript.
- Explained a large number (15) of previously unexplained empirical findings from economics, neuroscience & psychology.

Selected course projects:

- Used Gaussian mixture models to estimate propensity scores in R. Stat 186, Prof. Donald Rubin
- Developed inference algorithms for network-based epidemiology models in R. Stat 211, Prof. Edoardo Airoldi

DeepMind. Research Intern, Neuroscience Research Team. Supervisor: Prof. Matt Botvinick. May–Sept. 2018
Collaborated with a large team to publish a peer-reviewed article at **NeurIPS MetaLearn Workshop 2019**.

- Built and trained artificial agents based on recurrent neural networks within a large **TensorFlow** codebase.
- Demonstrated for the first time that causal reasoning can arise from model-free reinforcement learning.

Stanford University. Visiting Researcher, Dept. of Psychology. Supervisor: Prof. Noah Goodman. May–Aug. 2017
Built lasting collaborations leading to 3 peer-reviewed articles (2 published, 1 under review).

- Led a research project examining vector embeddings of natural language sentences in **PyTorch**.
- Established that these embeddings rely on local heuristics and lack compositionality, giving poor generalization.
- Introduced a new approach using augmented training data, improving generalization performance from 50% to 85%.

TECHNICAL SKILLS

Programming: **Python** (PyTorch, TensorFlow, scikit-learn, NumPy, Pyplot), **R** (dplyr, ggplot2), JavaScript, HTML.
Experience from select research projects (papers linked): representation learning for **natural language processing** [1, 2], **meta-learning** in deep recurrent networks via **reinforcement learning** [3], amortized **variational inference** with deep neural networks [4], **Bayesian optimization** [5], **Monte Carlo algorithms** [6, 7, 8].
Other technical skills: machine learning and statistics (classification, regression, clustering, hypothesis testing, model fitting, causal inference), high performance computing, experiment design, data analysis, data visualization.

SCIENTIFIC COMMUNICATION AND PUBLIC SPEAKING

Conference presentations: 6 presentations to audiences of 50–200, including at: **ICLR** (2020), Reinforcement Learning & Decision Making (2019), Cognitive Science Society (CogSci, 2017, 2018, 2019), **AAAI** Spring Symposium (2017).

Invited talks: 12 seminars to audiences of ~40 at 10 universities, including Brown, Berkeley, MIT, McGill, NYU.

Teaching: Teaching fellow for 3 courses in physics and mathematics. Student feedback available [here](#).

SELECTED AWARDS

Mind Brain Behavior Graduate Student Award. \$10K to fund a research visit to Stanford University. 2017
Student Award for Outstanding Scientific Contribution. International Conference on Thinking. 2016
Amartya Sen Fellowship. Graduate School of Arts and Sciences, Harvard University. 2014
R. P. Singh Memorial Prize. Outstanding graduating student, Department of Physics, IIT-Bombay. 2014

LEADERSHIP AND ORGANIZATION

Organized a full-day workshop (CogSci 2019) 12 speakers from industry and academia, 150+ attendees. 2019
Harvard Women in Physics. Organized a Communication and Negotiation Skills Seminar, ~30 attendees. 2017–2018
Teach for India, Mumbai. Ran a mentorship program, pairing students with volunteers from IIT Bombay. 2011–2012

INTERESTS AND HOBBIES: Indian classical dance (Odissi), Hindustani classical and Bengali vocal music.