

Ajay Subramanian

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EDUCATION

Ph.D.:	New York University, USA Cognition & Perception, Department of Psychology Advisor: Denis Pelli	2021 - 2026
B.E.:	Birla Institute of Technology and Science Pilani, India Electronics and Communication Engineering	2017 - 2021

RESEARCH AND WORK EXPERIENCE

2021 - present: New York University

Graduate Student Researcher. Supervisors: Denis Pelli
Neural-network models of the speed-accuracy tradeoff in human object recognition.

2020 - 2021: Harvard University & Massachusetts Institute of Technology

Research Intern. Supervisors: Samuel Gershman, Pedro Tsividis
Human-level reinforcement learning through theory-based modeling, exploration and planning.

2020: Center for Computational Brain Research (CCBR), Indian Institute of Technology Madras

Senior Thesis. Supervisor: Partha Mitra, Jaikishan Jayakumar
Automated detection of neuroanatomical features in gigapixel histological images using deep learning.

2019 - 2020: Cognitive Neuroscience Lab, BITS Pilani

Undergraduate Researcher. Supervisor: Veeky Baths
Deep learning for visual reconstruction from spoken word representations;
Review on reinforcement learning and its connections with neuroscience and psychology.

2019: Biologically Inspired Neural Network (BINN) Labs, BITS Pilani

Undergraduate Researcher. Supervisor: Basabdat Sen Bhattacharya
Simulating LGN response to background irradiance using spiking neural networks on SpiNNaker.

2019: GeNN Team, University of Sussex & International Neuroinformatics Coordinating Facility (INCF)

Google Summer of Code Intern. Supervisors: James Knight, Thomas Nowotny
Deep learning in spiking neural networks using GPU-enabled neural networks (GeNN).

2019: LetsTransport

Summer Intern. Supervisor: Nilay Sahu
Optimizing database querying and file upload speeds from a native Android application.

PUBLICATIONS & PREPRINTS

PREPRINTS

1. **Subramanian, A.**, Price, S., Sizikova, E., Kumbhar, O., Majaj, N. J., Pelli, D. G. (2022). SATBench: Benchmarking the speed-accuracy tradeoff in object recognition by humans and dynamic neural networks. *arXiv*.

PUBLICATIONS

2. Turner, J. P., Knight, J. C., **Subramanian, A.**, & Nowotny, T. (2022). mlGeNN: accelerating SNN inference using GPU-enabled neural networks. *Neuromorphic Computing and Engineering*, 2(2), 024002.
3. **Subramanian, A.**, Chitlangia, S., & Baths, V. (2022). Reinforcement learning and its connections with neuroscience and psychology. *Neural Networks*, 145, 271-287.

POSTER PRESENTATIONS

1. **Subramanian, A.**, Price, S., Sizikova, E., Kumbhar, O., Majaj, N., Pelli, D. G. (2022). Benchmarking dynamic neural-network models of the human speed-accuracy tradeoff. *Vision Science Society (VSS) Meeting*, St. Pete Beach, USA.
 2. **Subramanian, A.**, Patil, R., Baths, V. (2019). Word2Brain2Image. Visual Reconstruction from Spoken Word Representations. *Annual Conference of the Association for Cognitive Science in India (ACCS)*, Goa, India.
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TALKS

1. **Subramanian, A.** (2020). Word2Brain2Image: A data-driven approach towards understanding representations in the brain. *Round table track: Data issues in Cognitive Neuroscience*, International CCCP Symposium. Virtual.
 2. **Subramanian, A.** (2019). Open Source Development and Google Summer of Code. *Technology Incubator Programme Seminar*, BITS Pilani, Goa, India.
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AWARDS

2021: MacCracken Fellowship for doctoral studies, New York University.
2019: Matic Bounty Prize, InOut Hackathon, Bangalore, India.
2018: Literacy and Cognition Project research award, Max Planck Institute for Psycholinguistics.
2015: National Talent Search Scholarship, Government of India.

TEACHING AND OPEN-SOURCE

2020: **Co-creator**, *GenRL*
Open-source library for reproducible, generalizable reinforcement learning (github.com/SforAiDL/genrl)
2019: **Project Mentor**, *Learning to play games with deep reinforcement learning*
Technology Incubator Programme, BITS Pilani Goa, India
2018: **Course Instructor**, *Deep Learning*
Technology Incubator Programme, BITS Pilani Goa, India
2018: **Teaching Assistant**, *Computer Programming (CS F111)*
BITS Pilani, Goa, India

ACADEMIC SERVICE

2022: Reviewer, NeurIPS SVRHM Workshop
Reviewer, Journal of Neural Engineering
Reviewer, NeurIPS Datasets and Benchmarks Track
External Reviewer, ECML-PKDD
2020: Co-organizer, Summer Symposium on AI Research (SAiDL and APPCAIR, BITS Pilani Goa)

MEMBERSHIP

2021 - present Member, Vision Science Society
2018 - present Core Member, Society for Artificial Intelligence and Deep Learning (SAiDL)

TECHNICAL SKILLS

Programming: Python, C++, Java, C, MATLAB
Frameworks: PyTorch, TensorFlow, Keras, Flask
Tools: GCP, Travis CI, Docker, Slurm, LaTeX, Git, DialogFlow, Android Studio, MongoDB
Operating Systems: Mac OS, Linux, Windows

OTHER EDUCATION

Summer courses: Google Research India AI Summer School - Computer Vision track (2020)
Reinforcement Learning, Indian Institute of Technology Madras (2018)
Online courses: Machine Learning (Stanford, Coursera)

