

Lakshmi Narasimhan Govindarajan

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Education & Research Experience

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| Massachusetts Institute of Technology Postdoctoral Associate, Integrative Computational Neuroscience Center Advisors: Josh McDermott and Ila Fiete | Jan 2023 – Present |
| Brown University PhD in Cognitive Science Advisor: Thomas Serre | Sept 2017 – Dec 2022 |
| Statistical Machine Learning Theory Group, A*STAR, Singapore Research Associate Advisor: Li Cheng | Jul 2014 – Jul 2017 |
| National University of Singapore Bachelor of Computing (Hons) in Computer Science, Minor in Biophysics | Aug 2010 – Jul 2014 |
| Church Lab, Harvard Medical School Summer Intern Advisor: George Church | May 2013 – Aug 2013 |
| Laboratory-at-Large, Harvard SEAS Research Intern Advisor: Erez Lieberman Aiden | May 2012 – Dec 2012 |

Fellowships & Grants

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| K. Lisa Yang Postdoctoral Fellowship Award | 2023 - Present |
| Robert J. & Nancy D. Carney Graduate Fellowship | 2021 - 2022 |
| Turing Undergraduate Fellowship | 2011 - 2014 |

Awards & Honors

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| Raynor Cerebellum Project Discussion Leader | 2025 |
| DARPA Riser Early Career Award | 2022 |
| Presidential Award for Excellence in Teaching | 2021 |
| Center for Brains, Minds, and Machines Summer Program | 2021 |
| Certificate of Merit (Excellency in Algorithms & Theory) | 2014 |
| NUS Travel Scholarship | 2011 |
| International Schools Software Award | 2009 |
| National Young Talent in Computer Programming | 2009 |
| Computer Literacy Foundation Award | 2007 |

Publications (* equal contribution)

Calvert JS, Parker SR, **Govindarajan LN**, Darie R, Shaaya E, Solinsky R, ..., & Borton DA. *Translesional stimulation replaces lost sensory and motor function in persons with paraplegia*. Nature Biomedical Engineering (2025)

Govindarajan LN*, Iyer A*, Kothare V & Fiete I. *Flexible Context-Driven Sensory Processing in Dynamical Vision Models*. Conference on Neural Information Processing Systems (2024)

Goetschalckx L*, **Govindarajan LN***, Ashok AK, Ahuja A, Sheinberg DL & Serre T. *Computing a human-like reaction time metric from stable recurrent vision models*. Conference on Neural Information Processing Systems **Spotlight (Top 3%)** (2023)

Govindarajan LN, Calvert JS, Parker SR, Jung M, Darie R, Miranda P, Shaaya E, Borton DA & Serre T. *Fast inference of spinal neuromodulation for motor control using amortized neural networks*. Journal of Neural Engineering (2022)

Govindarajan LN, Kakodkar R & Serre T. *A practitioner's guide to improve the logistics of spatiotemporal deep neural networks for animal behavior analysis*. Visual observation and analysis of Vertebrate and Insect Behavior workshop, ICPR (2022)

Ashok AK, **Govindarajan LN**, Linsley D, Sheinberg D & Serre T. *The emergence of visual simulation in task-optimized recurrent neural networks*. SVRHM Workshop at NeurIPS (2022)

Fengler A, **Govindarajan LN**, Chen T & Frank MJ. *Likelihood approximation networks (LANs) for fast inference of simulation models in cognitive neuroscience*. Elife (2021)

Linsley D, Malik G, Kim J, **Govindarajan LN**, Mingolla E, & Serre T. *Tracking without re-recognition in humans and machines*. Conference on Neural Information Processing Systems (2021)

Linsley D*, Ashok AK*, **Govindarajan LN***, Liu R, & Serre T. *Stable and expressive recurrent vision models*. Conference on Neural Information Processing Systems **Spotlight (Top 3%)** (2020)

Schuch KN*, **Govindarajan LN***, Guo Y, Baskoylu SN, Kim S, Kimia B, Serre T & Hart AC. *Discriminating between sleep and exercise-induced fatigue using computer vision and behavioral genetics*. Journal of Neurogenetics (2020)

Wu S, Tan KJ*, **Govindarajan LN***, Stewart JC, Gu L, Ho JWH, Katarya M, Wong BH, Tan EK, Li D, Chang AC, Libedinsky C, Cheng L, & Aw SS. *Fully automated leg tracking of Drosophila neurodegeneration models reveals distinct conserved movement signatures*. PLoS Biology (2019)

Xu C, **Govindarajan LN**, Zhang Y & Cheng L. *Lie-X: Depth image based articulated object pose estimation, tracking, and action recognition on Lie groups*. International Journal of Computer Vision (2017)

Xu C, **Govindarajan LN** & Cheng L. *Hand action detection from ego-centric depth sequences with error-correcting Hough transform*. Pattern Recognition (2017)

Napolitano MG, Landon M, Gregg CJ, Lajoie MJ, **Govindarajan LN**, Mosberg JA, Kuznetsov G, Goodman DB, Vargas-Rodriguez O, Isaacs FJ, Söll D & Church GM. *Emergent rules for codon choice elucidated by editing rare arginine codons in Escherichia coli*. Proceedings of the National Academy of Sciences (2016)

Preprints and manuscripts in preparation

Govindarajan LN, Alavilli S, McDermott J. *Task-optimized models of sensory uncertainty reproduce human confidence judgments*. (2025; preprint available on bioRxiv)

Govindarajan LN*, Duan S*, Markman S, Patel N, Fiete IR, Logiaco L. *Complementary goal and prediction-driven learning systems in a neural network model of mammalian sensorimotor regions*. (in prep)

Govindarajan LN, Iyer A, Desimone R, DiCarlo J, Harnett M, Fiete IR. *Dynamical visual processing through cell type-specific recurrent and top-down circuits*. (in prep)

Govindarajan LN, Liu RG, Linsley D, Ashok AK, Reuter M, Frank M & Serre T. *Diagnosing and exploiting the computational demands of video games for deep reinforcement learning*. arXiv (2023).

Amso D, **Govindarajan LN**, Gupta P, Placido D, Baumgartner HA, Lynn A, ... & Serre, T. *Using Computational Analysis of Behavior To Discover Developmental Change In Memory-Guided Attention Mechanisms In Childhood*. psyArXiv (2022).

Guo Y, **Govindarajan LN**, Kimia B & Serre T. *Robust pose tracking with a joint model of appearance and shape*. arXiv (2018)

[Talk] *Perception in context*. Junior Theoretical Neuroscientist Workshop, Flatiron Institute (2025)

[Talk] *Human Confidence Reflects Calibrated Uncertainty Estimation*. CogLunch (BCS, MIT) (2025)

Govindarajan LN, Alavilli S & McDermott J. *Optimized Models of Uncertainty Explain Human Confidence in Auditory Perception*. APAN (2025)

Alavilli S, **Govindarajan LN** & McDermott J. *Source-Location Binding Errors in Auditory Scene Perception*. APAN (2025)

Govindarajan LN, Iyer A, Kothare V & Fiete I. *From Circuits to Behavior: Modeling Flexible Context-Driven Sensory Processing*. Cosyne (2025)

Govindarajan LN, Alavilli S & McDermott J. *Confidence in Sound Localization Reflects Calibrated Uncertainty Estimation*. Association for Research in Otolaryngology (48th Annual MidWinter Meeting) (2025)

[Talk] *Confidence in Sound Localization Reflects Calibrated Uncertainty Estimation*. 5th Joint Conference on Binaural and Spatial Hearing (2024)

Govindarajan LN, Stewart A, Alavilli S, Hess P, Francl A & McDermott J. *A Computational Framework for Sound Localization in Auditory Scenes*. Conference on Cognitive Computational Neuroscience (2024)

Govindarajan LN*, Iyer A* & Fiete I. *Feedback Model of Flexible Context Guided Sensory Processing*. Conference on Cognitive Computational Neuroscience (2024)

Govindarajan LN, Liu RG, Linsley D, Ashok AK, Reuter M, Frank M & Serre T. *Taxonomizing the Computational Demands of Videos Games for Deep Reinforcement Learning Agents*. Conference on Cognitive Computational Neuroscience (2022)

Goetschalckx L*, Zolfagher M*, Ashok AK, **Govindarajan LN**, Linsley D & Serre T. *Toward modeling visual routines of object segmentation with biologically inspired recurrent vision models*. Vision Sciences Society (Oral, 2022)

Parker SR*, **Govindarajan LN***, Calvert JS, Darie R, Shaaya E, Serre T. & Borton DA. *Leveraging increased electrode density to facilitate optimal epidural spinal stimulation location discovery*. Society for Neuroscience (2022)

Yebra M, Schjetan AGP, **Govindarajan LN**, Mosher C, Salimpour Y, Valiante TA, Kalia S, Anderson W, Mamelak A & Rutishauser U. *Evidence accumulation by single units in the human Medial Temporal Lobe (MTL) during memory-based decisions*. Society for Neuroscience (2022)

Parker SR, Calvert JS, Darie R, Shaaya E, **Govindarajan LN**, Jung M, Serre T, McLaughlin B & Borton DA. *Mediolateral Spinal Local Field Potentials Enable Real-Time Decoding of Gait Cycle in an Ovine Model*. Society for Neuroscience (2021)

Linsley D, **Govindarajan LN** & Serre T. *The recurrent neural circuits of contextual effects in visual cortex*. Cosyne (2021)

Amso D, **Govindarajan LN** & Serre T. *Using Computational Analysis of Behavior to Discover Memory-Guided Attention Mechanisms During Naturalistic Visual Search in Childhood*. Society for Research in Child Development (2021)

Linsley D, **Govindarajan LN** & Serre T. *Uncovering the circuit mechanisms that shape contextual phenomena with task-optimized recurrent neural networks*. Vision Sciences Society (2021)

Fengler A, **Govindarajan LN** & Frank M. *Encoder-Decoder Neural Architectures for Fast Amortized Inference of Cognitive Process Models*. Cognitive Sciences Society (2020)

Govindarajan LN, Serre T. & Colwill R. *Effects of response-contingent events on behavior in zebrafish larvae*. The 12th Zebrafish Disease Models Conference (2019)

Govindarajan LN, Sharma T, Colwill R. & Serre T. *Neural Computing on a Raspberry Pi: Applications to Zebrafish Behavior Monitoring*. VAIB (2018)

Teaching

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| Course 9.58: The Science of Intelligence (Project Mentor) | 2023 (MIT) |
| CLPS0950: Introduction to Programming | Spring '21, Spring '20, Fall '18 (Brown University) |
| CLPS1150: Memory and the Brain | Spring '18 (Brown University) |
| CS1020: Data Structures and Algorithms | Spring '11 (NUS) |

Mentorship

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| Jack King , M. Eng (CS), MIT | 2025-Present |
| Maya Rzek , UROP, MIT | 2025-Present |
| Valmiki Kothare , Research Software Engineer, MIT | 2024-2025 |
| Almas Alghamdi , Research Science Institute, MIT | 2024 |
| Sagarika Alavilli , Graduate Student, Harvard University | 2023-Present |
| Sophie Chen , Research Science Institute, MIT | 2023 |
| Isabella Longoria Valenzuela , UROP, Brown University | 2021-2022 |
| Max Reuter , Research Assistant, Brown University | 2020-2022 |
| Mainak Pal , Undergraduate Thesis, Brown University | 2020-2021 |
| Preeti Mukherjee , Undergraduate Thesis, Brown University | 2020-2021 |

Patents

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| Recurrent neural circuits | US Patent 11636346 |
| Zebrafish pose estimation and tracking using a 3d curve representation | SG Patent App. 10201600799U |
| An Automated Machine-Learning System to Track Arthropod Leg Movements and Its Use to Measure Fly Tremors | SG Patent App. 10201707833S |

Professional Service

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| Reviewer eNeuro, Trends in Hearing | 2024-Present |
| Reviewer PLoS Computational Biology | 2022-Present |
| Reviewer Conference on Neural Information Processing Systems | 2021-24 |
| Reviewer International Conference on Machine Learning | 2021-2024 |
| Distinguished Reviewer Award International Conference on Learning Representations | 2020 |
| AI and Creativity Brown-RISD Facilitator | 2019 |
| Deep Learning for \$150 Workshop Organizer | 2019 |
| Perception and Action Seminar Series Organizer | 2018-19 |
| Beyond Deep Learning Journal Club Lead | 2018 |
| Reviewer Association for the Advancement of Artificial Intelligence (AAAI) | 2017 |

References

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| Josh McDermott (Associate Professor, Massachusetts Institute of Technology) | jhm@mit.edu |
| Ila Fiete (Professor, Massachusetts Institute of Technology) | fiete@mit.edu |
| Thomas Serre (Professor, Brown University) | thomas_serre@brown.edu |
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| David Badre (Professor, Brown University) | david_badre@brown.edu |