

Gautham Vasan

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Research Interests

I'm interested in building machines with animal-like intelligence. To this end, I aim to understand computational principles that could enable agents such as robots to continually learn, adapt, develop, and improve throughout their lives.

Education

- Ph.D. in Computing Science**, University of Alberta, Canada 2020 - Present
- Supervisory Committee: Dr. Rupam Mahmood (advisor), Dr. Richard Sutton, Dr. Matthew Taylor
 - Dissertation (proposed): Real-Time Reinforcement Learning For Robots
- M.Sc. in Computing Science (Thesis)**, University of Alberta, Canada 2017
- Advisor: Dr. Patrick Pilarski
 - Dissertation: [Teaching a Powered Prosthetic Arm with an Intact Arm Using Reinforcement Learning](#)
- B.Tech. in Instrumentation and Control Engineering**, National Institute of Technology, Tiruchirappalli, India 2015
- Advisors: Dr. G. Saravana Ilango, Dr. V. Sankaranarayanan
 - Capstone Project: [Autonomous Visual Tracking and Landing of a Quadrotor on a Moving Platform](#)

Employment

- Sanctuary AI**, Research Intern: Reinforcement/Imitation Learning, Vancouver, Canada 05/2025 - 08/2025
- Design and development of novel reinforcement Learning (RL) and Imitation Learning (IL) algorithms for real-world manipulation tasks.
 - Developed general algorithms applicable to diverse robot embodiments, including Sanctuary's flagship humanoid, Phoenix, and industrial arms.
- University of Freiburg**, Visiting Researcher: DAAD Scholar, Freiburg im Breisgau, Germany 03/2023 - 06/2023
- Hosted by Dr. Joschka Boedecker as a part of a DAAD-Stiftung Unicore Fellowship.
 - Deep reinforcement learning research for integrating noisy electroencephalogram (EEG) signals decoded from a patient's brain, which includes preference and failure information, into a framework for skill learning on assistive robots.
- Ocado Technology (Formerly Kindred AI)**, Machine Learning Researcher, Toronto, Canada 2017 - 2020
- Devised deep reinforcement learning (RL) techniques for SORT, a piece-picking robot that grasps, scans and stows items in warehouses for clothing stores like GAP and American Eagle.
 - Supported the development of [SenseAct](#), an open-source computational framework for physical robot learning tasks.
 - Deployed [RLScan](#) to production. It uses deep RL to learn a vision-based control policy to scan barcodes on clothing with a Fanuc arm. It was trained end-to-end in production, learning from a fleet of robots across multiple warehouses.

Publications

Peer-Reviewed Publications

16. [Gautham Vasan](#), Mohamed Elsayed, Alireza Azimi, Jiamin He, Fahim Shahriar, Colin Bellinger, Martha White, A. Rupam Mahmood, [Deep Policy Gradient Methods Without Batch Updates, Target Networks, or Replay Buffers](#). *NeurIPS 2024 (Video/Code)*
15. Mohamed Elsayed, [Gautham Vasan](#), A. Rupam Mahmood, [Streaming Deep Reinforcement Learning Finally Works](#). *NeurIPS FITML Workshop 2024, (Code)*
14. [Gautham Vasan](#), Yan Wang, Fahim Shahriar, James S. Bergstra, Martin Jagersand, A. Rupam Mahmood, [Revisiting Sparse Rewards for Goal-Reaching Reinforcement Learning](#). *RLC 2024 (Video/Code)*
13. Huiyi Wang, Fahim Shahriar, Alireza Azimi, [Gautham Vasan](#), A. Rupam Mahmood, Colin Bellinger, [Versatile and Generalizable Manipulation via Goal-Conditioned Reinforcement Learning with Grounded Object Detection](#). *CoRL MRM-D Workshop 2024*
12. [Gautham Vasan](#). [Autonomous Skill Acquisition for Robots Using Graduated Learning](#). *AAMAS 2024*
11. Bram Grooten, Tristan Tomilin, [Gautham Vasan](#), Matthew E. Taylor, Rupam Mahmood, Meng Fang, Decibal Mocanu, [MaDi: Learning to Mask Distractions for Generalization in Visual Deep Reinforcement Learning](#). *AAMAS 2024 (Video/Code)*

10. [Gautham Vasan*](#), Yan Wang*, Fahim Shahriar, James S. Bergstra, A. Rupam Mahmood, Learning Sparse Reward Tasks on Real Robots From Scratch, *RAP4 Robotics Workshop, ICRA 2023*
9. Fengdi Che, [Gautham Vasan](#), A. Rupam Mahmood, Correcting discount-factor mismatch in on-policy policy gradient methods, *ICML 2023*
8. Yan Wang*, [Gautham Vasan*](#), A. Rupam Mahmood, Real-Time Reinforcement Learning for Vision-Based Robotics Utilizing Local and Remote Computers, *ICRA 2023 (Video/Code)*
7. Dmytro Korenkevych, A. Rupam Mahmood, [Gautham Vasan](#), James Bergstra, Autoregressive policies for continuous control deep reinforcement learning, *IJCAI 2019 (Video/Website)*
6. A. Rupam Mahmood, Dmytro Korenkevych, [Gautham Vasan](#), William Ma, James Bergstra, Benchmarking reinforcement learning algorithms on real-world robots, *CoRL 2018 (Video/Code/Website)*
5. [Gautham Vasan](#), Patrick M. Pilarski, Context-Aware Learning from Demonstration: Using Camera Data to Support the Synergistic Control of a Multi-Joint Prosthetic Arm, *IEEE BioRob 2018*
4. [Gautham Vasan](#), Patrick M. Pilarski, Learning from Demonstration: Teaching a Myoelectric Prosthesis with an Intact Limb via Reinforcement Learning, *IEEE ICORR 2017 (Video)*
Top 10% of submissions. Selected for oral presentation.
3. Kenny Young, [Gautham Vasan](#), Ryan Hayward, NeuroHex: A Deep Q-learning Hex Agent, *Computer Games Workshop at IJCAI 2016*
2. Juhi Ajmera, Siddharthan P. R., Ramaravind K. M., [Gautham Vasan](#), Naresh Balaji R. and V. Sankaranarayanan, Autonomous visual tracking and landing of a quadrotor on a moving platform, *IEEE ICIIP 2015 (Video)*
1. [Gautham Vasan](#), Naresh Balaji Ravichandran, Gowtham Kumar T.S.B, Aravind Govindan, G Saravana Ilango, A Control Strategy for an Autonomous Robotic Vacuum Cleaner for Solar Panels, *Texas Instruments Educators Conference 2014 (Video)*

Peer-reviewed Abstracts

- [Gautham Vasan](#), Patrick M. Pilarski, Mirrored Bilateral Training of a Myoelectric Prosthesis with a Non-Amputated Arm via Actor-Critic Reinforcement Learning, Reinforcement Learning and Decision Making (RLDM) 2017.
Top 8% of submissions. Selected for oral presentation.
- Craig Sherstan, Marlos C. Machado, Jaden Travnik, Adam White, [Gautham Vasan](#), Patrick M. Pilarski, Confident Decision Making with General Value Functions, Reinforcement Learning and Decision Making (RLDM) 2017.

Thesis

- [Gautham Vasan](#), Examining Committee: Patrick M. Pilarski, Martha White and K Ming Chan, Teaching a Powered Prosthetic Arm with an Intact Arm Using Reinforcement Learning, M.Sc Thesis, University of Alberta, Edmonton, Canada, 2017.
Won the M.Sc Outstanding Thesis Award in Computing Science.

Awards & Achievements

- AAMAS *Scholarship* to present at the Doctoral Consortium (2024)
- DAAD-Stiftung *UNICORE Scholarship* for a three-month research visit to the University of Freiburg (2023)
- DAAD *AINet Postdoctoral Networking Fellowship* (2022) to visit and foster collaborations with German research labs
- *University of Alberta Doctoral Recruitment Scholarship* Fall 2020/21
- Winner of the *M.Sc Outstanding Thesis Award* in Computing Science at the University of Alberta (2017)
- *Phase-1 Winners and Finalist* at the *Texas Instruments Innovation Challenge India Design Contest* (2014)

Teaching Experience

- CMPUT 340: Introduction to Numerical Methods (Winter 2024)
- CMPUT 653: Real-Time Policy Learning (Fall 2023)
- CMPUT 365: An Introduction to Reinforcement Learning (Winter 2021, Winter 2022, Fall 2022)
- CMPUT 174: Introduction to the Foundations of Computation I (Fall 2015, Winter 2016, Fall 2020)

Technical Skills

- Programming: Python, C++
- Tools: MuJoCo, PyTorch, Jax, ROS, Docker
- Research Areas: Reinforcement Learning, Deep Learning, Robotics, Real-Time Systems

Selected Talks

- *Streaming Deep Reinforcement Learning*, Cohere For AI, 28 Jan 2025 (Invited)
- *Deep Policy Gradient Methods Without Batch Updates, Target Networks, or Replay Buffers*, ML Collective, 7 Feb 2025. Also presented earlier at Mila, McGill University, Brown University and IIT Madras (Invited)
- *From Q-learning to Dreamer*, Amii Tea Time Talks, University of Alberta, 27 Aug 2024
- *Two Issues of Autonomous Robot Learning*, Amii AI Seminar, University of Alberta, 27 Oct 2023
- *Reward (Mis-)Specification in Reinforcement Learning*, Amii Tea Time Talks, 23 Aug 2023
- *Reinforcement Learning for Robots*, natChat @NeurAlbertaTech, 16 Feb 2023 (Invited)
- *Learning from Demonstration: Teaching a Myoelectric Prosthesis using an intact Limb via Reinforcement Learning*, Cognition Seminar, Dept. of Psychology, University of Alberta, 3 Feb 2017 (Invited)

Community Service

- *Reviewer*: ICML 2025 | RLC 2025 | Collas 2025 | ICLR 2025 | NeurIPS 2023, 2024 | IEEE BioRob 2024, 2018 | IEEE ICDL 2024 | IROS 2023, 2020
- Candidate selection for the CIFAR Deep Learning and Reinforcement Learning Summer School 2023 & 2024
- *Mentoring*: Six students at the University of Alberta (undergraduate and masters level) on robot learning research
- *Volunteer*: DiscoverE Summer Camp 2023, to showcase and explain robotics research and its real-world applications to Grade 4-6 students.
- Research Volunteer, The Hospital for Sick Children (SickKids, 2019)

Relevant Coursework

Graduate: Deep Policy Gradient Methods | Theoretical Foundations of Reinforcement Learning | Statistical Computing | Machine Learning and The Brain | Introduction to Reinforcement Learning | Introduction to Machine Learning | Convolutional Neural Nets for Image Processing | Actor-Critic Algorithms | Medical Robotics and Computer Assisted Surgery

Undergraduate: Linear Algebra and Probability Theory | Digital Signal Processing | Numerical Methods | Data Structures and Algorithms | Signals and Systems | Sensors and Transducers | Control Systems | Neural Networks and Fuzzy Logic

Personal

- **Citizenship:** Canada
- **Languages:** English, Tamil, Hindi

References

Available upon request.