

Shivam Garg

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| EDUCATION | University of Alberta, Canada | 2022–present |
| | Doctor of Philosophy in Computing Science (specialization in statistical machine learning) Supervisor: Prof. Dale Schuurmans | |
| | University of Alberta, Canada | 2019–21 |
| | Master of Science in Computing Science Supervisors: Prof. Rupam Mahmood and Prof. Martha White (Received CAIAC Best Master’s Thesis Award 2022) | |
| | Indian Institute of Technology (BHU) Varanasi, India | 2014–19 |
| | Integrated Dual Degree [BTech (Hons.) + MTech] in Computer Science and Engineering GPA: 9.77/10.0 (ranked 1/82 in my class) | |
| EXPERIENCE | Research Assistant, University of Alberta | Sept 2021–Aug 2022 |
| | – Worked with Prof. Csaba Szepesvári on reinforcement learning theory (mainly policy gradient methods) | |
| | Internship at Samsung R&D Institute India, Bangalore | May–Jul 2017 |
| | – Intern in the Android platform team – Worked on inducing traces in the Linux kernel for data logging – Investigated various machine learning techniques for handling the above data | |
| PAPERS | [P4] An Alternate Policy Gradient Estimator for Softmax Policies. [PDF] Shivam Garg, Samuele Tosatto, Yangchen Pan, Martha White, A. Rupam Mahmood. <i>International Conference on Artificial Intelligence and Statistics (AISTATS)</i> , 2022. | |
| | [P3] A General Class of Surrogate Functions for Stable and Efficient Reinforcement Learning. [PDF] Sharan Vaswani, Olivier Bachem, Simone Totaro, Robert Müller, Shivam Garg, Matthieu Geist, Marlos C. Machado, Pablo Samuel Castro, Nicolas Le Roux. <i>International Conference on Artificial Intelligence and Statistics (AISTATS)</i> , 2022. (Oral) | |
| | [P2] Gradient Temporal-Difference Learning with Regularized Corrections. [PDF] Sina Ghiassian, Andrew Patterson, Shivam Garg, Dhawal Gupta, Adam White, Martha White. <i>International Conference on Machine Learning (ICML)</i> , 2020. | |
| | [P1] Object Sequences: Encoding Categorical and Spatial Information for a Yes/No Visual Question Answering Task. [PDF] [DOI] Shivam Garg and Rajeev Srivastava. <i>IET Computer Vision</i> , 2018. | |
| WORK-SHOP PAPERS | [W3] Making Policy Gradient Estimators for Softmax Policies More Robust to Non-stationarities. [PDF] Shivam Garg, Samuele Tosatto, Yangchen Pan, Martha White, A. Rupam Mahmood. <i>The Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM)</i> , 2022. (an extended abstract based on [P4]) | |
| | [W2] Enabling Safe Exploration of Action Space in Real-World Robots. [PDF] Shivam Garg, Homayoon Farrahi, A. Rupam Mahmood. <i>Virtual Conference on Reinforcement Learning for Real Life (RL4RealLife)</i> , 2020. | |
| | [W1] Mirror Descent for Robust Reinforcement Learning. [PDF] Shivam Garg. <i>Indian Workshop on Machine Learning (iWML)</i> , 2018. | |

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| THESES | [T2] | Analysis of an Alternate Policy Gradient Estimator for Softmax Policies. [PDF] Shivam Garg. <i>M.Sc. Thesis, University of Alberta</i> , 2021. (based on [P4]) |
| | [T1] | Coordinated Exploration for Concurrent Reinforcement Learning. [PDF] Shivam Garg. <i>M.Tech. Thesis, Indian Institute of Technology (BHU) Varanasi</i> , 2019. |
| AWARDS AND HONORS | | Alberta Graduate Excellence Scholarship recipient 2022 Awarded by Faculty of Graduate Studies and Research, University of Alberta |
| | | Nominated for the WAGS/ProQuest Distinguished Master’s Thesis Award 2022 For the thesis [T2] titled “Analysis of an Alternate Policy Gradient Estimator for Softmax Policies” (each “Western Association of Graduate Schools” member institution may submit one nomination for this award) |
| | | Co-winner of the Best Master’s Thesis Award, CAIAC 2022 For the thesis [T2] titled “Analysis of an Alternate Policy Gradient Estimator for Softmax Policies” (every academic unit within a Canadian university nominates one master’s thesis in the field of AI to the Canadian Artificial Intelligence Association) [Link] |
| | | Nomination for the Best Paper Award, AISTATS 2022 For the paper [P3] titled “A General Class of Surrogate Functions for Stable and Efficient Reinforcement Learning” (top four out of the 492 papers at the International Conference on Artificial Intelligence and Statistics) [Link] |
| | | Gold Medal, IIT (BHU) Varanasi 2019 For being ranked first in the Computer Science & Engineering batch of 2014–19 |
| | | Awarded CBSE certificate of merit 2014 For being amongst the top 0.1% candidates in Physics (class XII) |
| | | Successfully qualified Regional Mathematical Olympiad, UP 2012 State level for the International Mathematical Olympiad (about 300 students selected nationally) |
| | | National Talent Search Scholarship recipient 2010 Awarded by NCERT, Government of India (about 1000 students selected nationally) |
| TEACHING ASSISTANT | | University of Alberta |
| | | CMPUT 653 – Theoretical Foundations of RL (Grad) [Link] Winter 2021 CMPUT 655 – Reinforcement Learning 1 (Grad) [Link] Fall 2020 CMPUT 365/397 – Reinforcement Learning [Link] Winter 2023, Fall 2022, Winter 2020 CMPUT 366 – Intelligent Systems Fall 2019 |
| | | IIT (BHU) Varanasi |
| | | CSE 205 – IT Workshop 2 Aug–Dec 2018 CSE 241N – Artificial Intelligence Jan–May 2018 CSO 101 – Computer Programming Jan–May 2019, Jan–May 2018, Aug–Dec 2017 Jan–May 2017, Aug–Dec 2016 |
| SERVICE | | Reviewer for one paper at AISTATS 2023 • Sub-reviewer for one paper for the journal of Artificial Intelligence (AIJ) 2022 • Participating as an early career professional for the UA-WISE/WISER mentorship program 2022 • Reviewer for AISTATS 2022 (a top 10% reviewer) • Reviewer for SSL-RL (ICLR Workshop) 2021 • Helped create Python notebooks for the “Policy Optimization in RL” tutorial at NeurIPS 2020 [Link] • Student reporter for CIFAR Deep Learning and Reinforcement Learning Summer School 2020 • Sub-reviewer for one paper at ICML 2020 • Served as the Vice President of the Computing Science Graduate Student Association, University of Alberta (2020–21). |
| SKILLS | | Python · PyTorch · C · L ^A T _E X · Emacs |

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| COURSES | Graduate at UAlberta | |
| | <ul style="list-style-type: none"> – Probability and Measure (ongoing) – High Dimensional Probability (ongoing) – Statistics for Learning (ongoing) – Stochastic Analysis – Probabilistic Graphical Models | <ul style="list-style-type: none"> – Statistical Inference – RL with Robots – Intro. to Machine Learning – Reinforcement Learning 2 |
| | Undergraduate at IIT (BHU) | |
| | <ul style="list-style-type: none"> – Stochastic Process – Probability and Statistics – Optimization Techniques – Natural Language Processing – Computer Vision | <ul style="list-style-type: none"> – Linear Algebra (Online) – Intelligent Computing (Neural Networks and Genetic Algorithms) – Artificial Intelligence |
| OTHER PROJECTS | Utility of Traces in Online Value Prediction with TD(λ) [Link] | April'20 |
| | Policy Learning using Function Approximators | Aug–Nov'17 |
| | Emerging and Rare Entity Recognition (NLP) | Dec'17 |
| | Cryptography Schemes for Secure Money Transfer [Link] | Nov'17 |
| | Zoutendijk's Method for Constrained Optimization | Nov'17 |
| | Image Classification and Segmentation | Aug'16–May'17 |
| | Functional Projective Synchronization of Chaotic Systems [Link] | Nov'16 |
| | In-memory Relational Algebra System [Link] | Aug–Nov'16 |
| | Feedback Portal (a Django web application) [Link] | Aug–Nov'16 |
| | Multi-document Text Summarizer | Jan–May'16 |
| | 8-bit CPU simulation on Logisim | Oct'15 |
| EXTRA–CURRICULAR | I enjoy going for long walks, rock climbing, and cycling; and playing harmonica, table tennis, and Go (the board game). | |