

Shivam Garg

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EDUCATION	University of Alberta, Canada 2019–21 Master of Science (Thesis) in Computing Science Supervisors: Prof. Rupam Mahmood and Prof. Martha White GPA: 4.0/4.0 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)
INTERESTS	Artificial Intelligence, Reinforcement Learning (in particular, policy gradient methods and temporal difference learning)
PUBLICATIONS	Conferences and Journals [1] Sina Ghiassian*, Andrew Patterson*, Shivam Garg, Dhawal Gupta, Adam White, Martha White, Gradient Temporal-Difference Learning with Regularized Corrections , <i>International Conference on Machine Learning (ICML)</i> , 2020. [2] Shivam Garg and Rajeev Srivastava, Object Sequences: Encoding Categorical and Spatial Information for a Yes/No Visual Question Answering Task , <i>IET Computer Vision</i> , 2018. Workshops [3] Shivam Garg*, Homayoon Farrahi*, A. Rupam Mahmood, Enabling Safe Exploration of Action Space in Real-World Robots , <i>Virtual Conference on Reinforcement Learning for Real Life (RL4RealLife)</i> , 2020. [4] Shivam Garg, Mirror Descent for Robust Reinforcement Learning , <i>Indian Workshop on Machine Learning (iWML)</i> , 2018.
TEACHING ASSISTANT	University of Alberta CMPUT 655 – Reinforcement Learning 1 (Grad) Fall 2020 CMPUT 397 – Reinforcement Learning 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
EXPERIENCE	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.
SKILLS	Python · PyTorch · C · C++ · Matlab · L ^A T _E X · Emacs
PROJECTS	Log-likelihood Baseline for Policy Gradient May 2020–Present <i>Supervisors: Prof. Rupam Mahmood and Prof. Martha White</i> – Policy gradient methods have a critic baseline to reduce the variance of their estimate. In this project, we are investigating an analogous baseline for the log-likelihood part of the policy gradient. We have some encouraging preliminary results which show that a log-likelihood baseline can improve the agent’s control performance by further reducing its variance and can especially help in non-stationary environments.

Aug 2018–Jun 2019

- Extended prior work on seed sampling for Concurrent reinforcement learning (RL) by proposing (1) a model based, and (2) a policy gradient based seed sampling coordinated exploration algorithm (Seed-PG).
- Implemented the Seed-PG algorithm, which basically involved implementing on-policy and off-policy versions of Policy Gradient methods (PPO, Off-PAC, and Actor-Critic) with MC and TD value functions (using importance sampling), for multiple parallel agents (running on separate processes) which share experience amongst them.
- Performed experimentation on the CartPole environment using neural networks as function approximators.

* Unofficial grade. No official grades awarded that semester due to COVID-19.