Shibhansh Dohare

Ph.D. student, Computing Science, University of Alberta
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Educational Qualifications

- Ph.D. in Computing Science *Ongoing*
  University of Alberta; Advisors - Dr. Richard S. Sutton and Dr. Rupam Mahmood
- Master of Science in Computing Science *2020*
  University of Alberta; Advisors - Dr. Richard S. Sutton and Dr. Rupam Mahmood
  Thesis - *The Interplay of Search and Gradient Descent in Semi-stationary Learning Problems*
- Bachelor of Technology in Computer Science and Engineering 2018
  Indian Institute of Technology Kanpur

Publications

Journals

- *Loss of Plasticity in Deep Continual Learning*. Shibhansh Dohare, J Fernando Hernandez-Garcia, Qingfeng Lan, Parash Rahman, Richard S. Sutton, A. Rupam Mahmood. *Nature*, 2024.

Refereed Conferences

- *Automatic Noise Filtering with Dynamic Sparse Training in Deep Reinforcement Learning*. Bram Grooten, Ghada Sokar, Shibhansh Dohare, Elena Mocanu, Matthew Taylor, Mykola Pechenizkiy, Decebal Constantin Mocanu. AAMAS 2023.
- *Gamma-Nets: Generalizing Value Estimation over Timescale*. Craig Sherstan, Shibhansh Dohare, James MacGlashan, Patrick M. Pilarski. AAAI 2020, *Oral Presentation.*

Workshops & Lightly-Refereed Conferences

- *Overcoming Policy Collapse in Deep Reinforcement Learning*. Shibhansh Dohare, Qingfeng Lan, Rupam Mahmood. Sixteenth European Workshop on Reinforcement Learning, 2023.
- *Automatic Noise Filtering with Dynamic Sparse Training in Deep Reinforcement Learning*. Bram Grooten, Ghada Sokar, Shibhansh Dohare, Elena Mocanu, Matthew Taylor, Mykola Pechenizkiy, Decebal Constantin Mocanu. Spotlight at Sparsity in Neural Networks workshop at ICLR 2023.
- *Continual Backprop: Stochastic Gradient Descent with Persistent Randomness*. Shibhansh Dohare, Richard S. Sutton, Rupam Mahmood. Reinforcement Learning and Decision Making (RLDM), 2022.
- *The Interplay of Search and Gradient Descent in Semi-stationary Learning Problems*. Shibhansh Dohare, Rupam Mahmood, Richard S. Sutton. Beyond Backpropagation, Workshop at NeurIPS 2020.
- *Unsupervised semantic abstractive summarization*. Shibhansh Dohare, Vivek Gupta, Harish Karnick. In Proceedings of ACL 2018, Student Research Workshop.

Invited Talks and Discussions

- Loss of Plasticity in Deep Continual Learning
  Beijing Academy of Artificial Intelligence *Sep 2024*
  Openmind Continual Learning Retreat *Nov 2023*
- Guest on AMII's Approximately Correct Podcast *Sep 2024*
  What it's like to publish in Nature [Spotify]
- Guest on **Nature Podcast** *Aug 2024*
  AI can't learn new things forever — an algorithm can fix that [Spotify]
- **Panelist** for discussion on Continual Learning *Nov 2023*
  Thought Club of Huawei Canada Research Institute
- Maintaining Plasticity in Deep Continual Learning [video]
  Barbados Reinforcement Learning Workshop *Feb 2023*
  AI Seminar, University of Alberta *Jan 2023*
  RL Sofa, MILA *Nov 2022*
  Keynote at CoLLAs, shared with Dr. Richard S. Sutton *Aug 2022*

- Tea Time Talk — University of Alberta 2019, 2020, 2021, 2023
- The Interplay of Search and Gradient Descent in Semi-stationary Learning Problems *Sep 2020*
  M.Sc. thesis seminar, University of Alberta

Achievements and Accolades

- Received the University of Alberta Doctoral Recruitment Award, 2021
- Co-led the university's team in our debut in the National Competition on Student Autonomous Underwater Vehicle (2016); we were the first runner-ups among 17 teams
- **Ranked 144** among the top 150,000 students selected from JEE MAINS in JEE Advanced '14
- Scored 325/360 (**99.99 percentile**) in JEE-MAINS examination '14 over 1.3 million students
- Awarded KVPY fellowship in 2013-14 organized by the Department of Science and Technology, India

Experiences

- *Research Intern*, Huawei Technologies Canada *May'24 - Ongoing*
- *Graduate Research Assistant* *May'19 - Ongoing*
  RLAI Lab, University of Alberta
- *Teaching Assistant*, University of Alberta
  - CMPUT 365: Introduction to Reinforcement Learning *Jan'24 - Apr'24*
  - CMPUT 365: Introduction to Reinforcement Learning *Jan'23 - Apr'23*
  - CMPUT 397: Reinforcement Learning *Jan'22 - Apr'22*
  - CMPUT 296: Basics of Machine Learning *Jan'20 - Apr'20*
- *Reinforcement Learning Researcher*, NTWIST *Jun'21 - Dec'21*
- *Undergraduate Researcher* *Jan'17 - Dec'17*
  Mentor: Prof. Harish Karnick, Dept. of Computer Science and Engineering, IIT Kanpur

Research Interests

- My long-term research goal is to understand the working of our minds. Specifically, to find the fundamental computational principles that give rise to the Mind, popularly known as Artificial Intelligence
- In pursuit of this goal, I am working on various aspects of online representation learning, reinforcement learning, and deep learning
- Most recently, I have focused on designing algorithms that can keep learning new things as our recent work showed that standard deep learning algorithms slowly lose plasticity, the ability to keep learning new things

Technical Skills

- Proficient in languages like Python, and C/C++. Seven years of experience with Linux-based operating systems, Shell scripting (Bash), and version control (Git)
- In-depth experience with popular machine learning and linear algebra libraries like Pytorch, Tensorflow, Numpy, Pandas, sklearn
- Ability to communicate clearly as demonstrated by published works and public presentations

Academic Services

- Co-organized the first RLAI Summit 2024
- Reviewed applications for CIFAR Deep Learning & Reinforcement Learning Summer School 2023, 2024
- NeurIPS, (Top) Reviewer 2023, 2024
- CoLLAs, Reviewer 2023, 2024
- ICLR, Reviewer 2024
- ICML, Reviewer 2024
- IJCAI, Reviewer 2024
- RLC, Reviewer 2024
- CVPR Continual Learning Workshop, Reviewer 2024
- IMOL Workshop at NeurIPS, Reviewer 2023