

Shibhansh Dohare

Ph.D. student, Computing Science, University of Alberta
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Education

- Ph.D. in Computing Science 2025 (*Expected*)
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
 - Scalable Next Generation AI for the Real World, Singapore Dec 2024
 - Montreal Institute of Learning Algorithms Nov 2024
 - **Keynote** at AI Summit, Block Inc Nov 2024
 - Openmind Continual Learning Retreat Oct 2024
 - IEEE Functional Safety Standards Committee Oct 2024
 - Simon Fraser University Sep 2024
 - University of British Columbia Sep 2024
 - Beijing Academy of Artificial Intelligence Sep 2024
- Guest on the CHED radio station in Edmonton to discuss loss of plasticity Nov 2024

- Guest on AMII's Approximately Correct Podcast
What it's like to publish in Nature Sep 2024
[Spotify]
- Guest on the **Nature Podcast**
AI can't learn new things forever — an algorithm can fix that Aug 2024
[Spotify]
- **Panelist** for discussion on Continual Learning
Thought Club of Huawei Canada Research Institute Nov 2023
- Maintaining Plasticity in Deep Continual Learning [video]
 - Openmind Continual Learning Retreat Nov 2023
 - 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

Work Experiences

- *Research Intern*, Huawei Technologies Canada May'24 - Ongoing
- *Graduate Research Assistant*
RLAI Lab, University of Alberta May'19 - Ongoing
- *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, IIT Kanpur

Selected Achievements and Accolades

- Received the University of Alberta Doctoral Recruitment Award, 2021
- Co-led IIT Kanpur's team in its debut in the National Competition on Student Autonomous Underwater Vehicle (2016); we secured second position among 17 teams
- **Ranked 144** among the top 150,000 students selected from JEE Main in JEE Advanced 2014
- Scored 325/360 (**99.99 percentile**) in JEE-Main examination 2014 with over 1.3 million students
- Awarded KVPY fellowship in 2013-14 organized by the Department of Science and Technology, India

Research

- My long-term research goal is to understand the workings of our minds. Specifically, to help find the computational principles that give rise to the mind. In pursuit of this goal, I am working on various aspects of continual learning, reinforcement learning, and deep learning
- I have contributed to exposing a fundamental problem with deep learning systems, where these systems can lose the ability to learn new things. I also developed the continual backpropagation algorithm to overcome this problem. This research has been published in Nature and featured in some popular media outlets and podcasts.

Technical Skills

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

Community Services

• Co-organized Openmind Retreat	2024
• 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