# BAVISH KULUR

**Research Interests:** Reinforcement Learning, Deep Learning, Continual Learning
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## Education

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| **University of Alberta** | 2025 - Present |

MSc (Thesis) - Computing Science         GPA: 4.0/4.0
Advisor: Prof. Marlos C. Machado
*Courses: Reinforcement Learning I, Foundations of Reasoning in LLMs*

**Indian Institute of Technology Bombay**        2017 - 2022
Dual Degree - BTech in Mechanical Engineering and MTech in AI and Data Science    GPA: 8.84/10
Minor in Computer Science and Engineering
*Relevant Courses: Advanced ML, Foundations of Intelligent and Learning Agents,*
*Learning over Graphs, Operating Systems, Data Structures and Algorithms*

## Publications

[AAMAS] Richa Verma, **Bavish Kulur,** Sanjay Chawla, Balaraman Ravindran.
PREFINE: Preference-Based Implicit Reward and Cost Fine-Tuning for Safety Alignment
International Conference on Autonomous Agents and Multiagent Systems 2026 [Paper Link]

## Experience

**Post-Baccalaureate Research Fellow** Robert Bosch Centre for Data Science and AI  Nov 23 - Jun 25
Indian Institute of Technology Madras, Advisor: Prof. Balaraman Ravindran

**Product Engineer (SDE 1)** Sprinklr Ltd. *Gurugram, India*        Jul 22 - Feb23

**Software Engineering Intern** Arturo Technologies, *Bangalore, India*        Mar - Jun 19

## Technical Skills

**Machine Learning:** Python, PyTorch, JAX
**Software Development:** C++, Java, Spring, Javascript, ReactJS, MongoDB, SQL, Docker, Git, Linux

## Key Projects

**Exploration in Continual RL**        Sept 25 - Present
Advisor: Prof. Marlos Machado (UAlberta)
   *Working on RL algorithms for exploration reset-free environments.*

**GARE: Greedy Actor Regularized Expert** (Course Project)        Sept - Dec 25
Advisor: Prof. Martha White (UAlberta)
   *Proposed a value-based RL algorithm for continuous action spaces, where the maximal action for*
   *TD update is found using gradient ascent starting from a proposal action given by a learned*
   *function. Showed that it outperforms the baseline algorithms GreedyAC and SAC.*

### Safe Reinforcement Learning using Direct Preference Optimization — 2024 - 25
Advisors: Prof. Balaraman Ravindran (IIT Madras), Dr. Sanjay Chawla (QCRI, Qatar)
*Offline post-hoc fine-tuning of RL policy to make it safe and aligned to human preferences.*

### Fairness Evaluation of Distilled LLMs — 2024 - 25
Advisors: Prof. Balaraman Ravindran (IIT Madras) and Prof. Karthik Sheshadri (NIT AP)
*Task-specific models can be built through knowledge distillation of LLMs. Prior work in knowledge distillation methods only considers computation time and accuracy metrics. In this work, we investigated the effect of knowledge distillation on fairness metrics.*

### Microstructure CT Image Segmentation (Thesis project) — 2021 - 22
Advisor: Prof. Shyamprasad Karagadde (IIT Bombay)
*Trained U-Net based image segmentation models for segmenting microstructures in real-world CT images of materials (aluminum alloys) and performed analysis such as computation of porosity, etc. Integrated the trained model into ImageJ software.*

### Parallelizing Stochastic FEM Analysis (Course project) — Jan - Apr 2021
Advisor: Prof. S. Gopalakrishnan (IIT Bombay)
*Parallelized the Response Surface algorithm for Stochastic Finite Element Analysis. Reduced the computation time by 35% by implementing CUDA kernel functions to use GPU and multi-threading using OpenMP.*

## Teaching Assistantships

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| CMPUT356 Reinforcement Learning, University of Alberta | Sept - Dec 2025 |
| Introduction to Machine Learning, NPTEL (MOOC) | Jan - Apr 2025 |
| CS101 Computer Programming and Utilization, IIT Bombay | Jan - Apr 2019 |

## Achievements

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| Selected to attend the Reinforcement Learning workshop at Indian Institute of Science | 2024 |
| Ranked 4 (out of 20) in AI and Data Science batch at IIT Bombay | 2022 |
| Received Student Innovation grant from ARTPARK, Indian Institute of Science | 2021 |
| Selected for a semester exchange at National University of Singapore (NUS) | 2020 |
| Received Kishore Vaigyanik Protsahan Yojana (KVPY) award from Department of Science and Technology, Government of India | 2017 |
| Cleared Regional Mathematical Olympiad and attended Indian National Mathematics Olympiad training camp at Indian Statistical Institute, Bangalore | 2015 |

## Activities

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| Convener, Web and Coding Club, IIT Bombay | 2018 - 19 |
| Developer and Founding Member, InstiApp, Developers Community, IIT Bombay | 2018 - 19 |