GUNSHI GUPTA

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Education

OATML Lab, University of Oxford — **Oxford, UK**
D.Phil, Machine Learning (sup. by Prof. Yarin Gal, Dr. Rowan McAllister, Dr. Adrien Gaidon) — *Sept. 2021-Present*

Montreal Institute of Learning Algorithms (MILA) — **Montreal, Quebec**
Research Master's, Machine Learning | GPA: 4.0/4.0 — *Sept. 2018-Aug. 2020*

Delhi Technological University (DTU) — **New Delhi, India**
Bachelor of Technology, Mathematics and Computing, Applied Math | GPA: 8.05/10 — *Sept. 2012-May 2016*

Recent Work Experience

Microsoft Research (MSR) — **Cambridge, UK**
Deep Learning Intern, Gaming Intelligence Team — *April 2023-July 2023*

- Contributed to two conference submissions on developing a VQGAN-Transformer-based world-and-action model trained on sequences from 3 years of gameplay data from a high-fidelity collaborative multi-agent XBox game.
- Developed an evaluation suite for mechanistic interpretability of transformer representations, probing for concepts related to emergent game-state and multi-agent awareness.

Wayve Technologies (End-to-End Autonomous Driving Startup) — **London, UK**
Deep Learning Researcher, Policy Learning Team — *July. 2020-August 2021*

- Researched Offline RL methods for learning safe driving policies from imbalanced data. Efforts include extending the framework to incorporate sparse feedback signals like corrective actions into the learning loop.

Robotics Research Center, IIIT Hyderabad — **Hyderabad, India**
Graduate Research Assistant (under Dr. K. Madhava Krishna) — *Jan. 2017-May 2018*

- Project for Center of Artificial Intelligence and Robotics : Developed Multi Robot SLAM framework facilitating Incremental/Batch Optimization, Centralized/Distributed map merging, Dense point cloud registration, Robot Encounters with Visual Odometry based front-end [Nonlinear Convex optimisation, Multi-View Geometry]
- Tested framework successfully on Husky UGV Robot Platform for complex trajectories.

Research

- *Memo: Training Memory-Efficient Transformer-Based Agents with Reinforcement Learning*
  Gunshi Gupta, Karmesh Yadav, Zsolt Kira, Yarin Gal, Rahaf Aljundi [Under Review]
- *WHAM! World and Human Action Modelling in a Modern Xbox Game*
  Gaming Intelligence, MSR [Under Review]
- *Architecting Generative AI Capabilities To Support Human Creative Ideation*
  Gaming Intelligence, MSR [To appear in Nature]
- *Pre-trained Text-to-Image Diffusion Models Are Versatile Representation Learners for Control*
  Gunshi Gupta, Karmesh Yadav, Yarin Gal, Dhruv Batra, Zsolt Kira, Cong Lu and Tim G.J. Rudner
  [NeurIPS 2024 spotlight, Oral talk at Generative AI for Decision Making Workshop at ICLR 2024]
- *Can Active Sampling Reduce Causal Confusion in Offline Reinforcement Learning?*
  Gunshi Gupta, Tim G.J. Rudner, Rowan McAllister, Adrien Gaidon and Yarin Gal
  [CleaR 2023, Neurips OfflineRL Workshop 2022]
- *ReLU to the Rescue: Improve Your On-Policy Actor-Critic with Positive Advantages*
  Andrew Jesson, Chris Lu, **Gunshi Gupta**, Jakob Foerster and Yarin Gal [ICML 2024]
- *La-MAML: Look-Ahead Meta Learning for Continual Learning*
  Gunshi Gupta*, Karmesh Yadav* and Liam Paull [NeurIPS 2020 Oral] [ArXiV][NeurIPS] [Code]

- *Probabilistic object detection: Strengths, Weaknesses, and Opportunities* [ICML AIAD 2020 Workshop] Dhaivat Bhatt*, Dishank Bansal*, **Gunshi Gupta***, Hanju Lee, Krishna Murthy J., Liam Paull
- *Unifying Variational Inference and PAC-Bayes for Generalisation Bounds in Imitation Learning* Sanjay Thakur, Herke Van Hoof, **Gunshi Gupta** and David Meger [Preprint].
- *Stein Variational Methods for Robot Navigation* [ICML 2019 Workshop: Stein Methods in Machine Learning]
- *Viewpoint Invariant Junction Recognition using Deep Network Ensembles* (IROS 2018) [Link] Abhijeet Kumar*, **Gunshi Gupta***, Avinash Sharma and K. Madhava Krishna.
- *Geometric Consistency for Self-Supervised End-to-End Visual Odometry* [Link][CVPR 2018 Workshop: Deep Learning for Visual SLAM]: Ganesh Iyer*, J. Krishna Murthy*, **Gunshi Gupta**, and Liam Paull.

Outreach

- Invited Talk: "Deep learning for Autonomous Driving" at OxBridge Women in Computer Science 2021 conference.
- Panelist at ICML Women in Machine Learning Social organised by OxWoCS 2022.
- Appointed as an ED&I Fellow with MPLS (Maths, Physics, Life-Sciences) department at Oxford (2022-2023)
- LatinX-in-AI Mentor - 2021 cohort