

Ankur Sikarwar

PhD Student in Computer Science
Université de Montréal, Montreal, Canada
Mila – Quebec AI Institute, Montreal, Canada

Email: ankursikarwardc@gmail.com

Website: sikarwarank.com

Links: [GitHub](#) / [Google Scholar](#)

Research Interests: Video World Models, Representation Learning, and Spatial Intelligence.

Current Position

Aug 2024–
present **Mila - Quebec AI Institute**, Montreal, Canada
Graduate Researcher | Project Advisors: *Prof. Aishwarya Agrawal, Dr. R Devon Hjelm*
• Working on physically grounded video world models, and spatial reasoning in VLMs.

Education

Aug 2024–
present **Mila – Quebec Artificial Intelligence Institute / Université de Montréal**, Montreal, Canada
Ph.D. in Computer Science | Expected graduation: Aug 2029
Advisor: *Prof. Aishwarya Agrawal*

Jul 2017–
Jun 2021 **Birla Institute of Technology, Mesra**, India
Bachelor of Engineering | Electronics & Communication
First Class with Distinction

Selected Publications

C: conference papers; J: journal articles; S: manuscripts under review; P: preprints.

*Equal contribution.

- [C5] Qian Yang, **Ankur Sikarwar***, Huy Le*, Le Zhang, Perouz Taslakian, Aishwarya Agrawal. How and What to Imagine? Visual Thinking in Unified Multimodal Models for Cross-View Spatial Reasoning. *EMNLP'26 — Conference on Empirical Methods in Natural Language Processing*. [Paper]
- [S1] **Ankur Sikarwar***, Debangana Mishra*, Sudarshan Nikhil, Ponnurangam Kumaraguru, Aishwarya Agrawal. Communicating about Space: Language-Mediated Spatial Integration Across Partial Views. *TMLR — Transactions on Machine Learning Research*. [In Review] [Paper] [Code]
- [S2] Rabiul Awal, Jinseong Jeong, **Ankur Sikarwar**, Parisa Kordjamshidi, Andrii Zadaianchuk, Sai Rajeswar, Paul Hongsuck Seo, Aishwarya Agrawal. One Flow-Transformer for Imagination and Control. *RLC 2026 WMW ICLR'27 — International Conference on Learning Representations*. [In Review] [Paper]
- [J1] Mengmi Zhang*, Elisa Pavarino*, Xiao Liu*, Giorgia Dellaferriera*, **Ankur Sikarwar***, ..., Gabriel Kreiman. Can Machines Imitate Humans? Integrative Turing-like tests for Language and Vision Demonstrate a Narrowing Gap. *Nature Human Behaviour*, 2026 [Paper]
- [C4] Saba Ahmadi*, Rabiul Awal*, **Ankur Sikarwar***, Amirhossein Kazemnejad*, Ge Ya Luo, Juan A. Rodriguez, Sai Rajeswar, Siva Reddy, Christopher Pal, Benno Krojer, Aishwarya Agrawal. The Promise of RL for Autoregressive Image Editing. *NeurIPS'25 — Conference on Neural Information Processing Systems*. [Paper] [Code]
- [C3] **Ankur Sikarwar**, Mengmi Zhang. Decoding the Enigma: Benchmarking Humans and AIs on the Many Facets of Working Memory. *NeurIPS'23 — Conference on Neural Information Processing Systems*. [Paper] [Code]
- [C2] Parantak Singh, You Li, **Ankur Sikarwar**, Weixian Lei, Daniel Gao, Morgan Bruce Talbot, Ying Sun, Mike Zheng Shou, Gabriel Kreiman, Mengmi Zhang. Learning to Learn: How to Continuously Teach Humans and Machines. *ICCV'23 — International Conference on Computer Vision*. [Paper] [Code]
- [C1] **Ankur Sikarwar**, Arkil Patel, Navin Goyal. When Can Transformers Ground and Compose: Insights from Compositional Generalization Benchmarks. *EMNLP'22 (Oral) — Conference on Empirical Methods in Natural Language Processing*. [Paper] [Code]
- [P1] Xiao Liu, **Ankur Sikarwar**, Joo Hwee Lim, Gabriel Kreiman, Zenglin Shi, Mengmi Zhang. Reason from Context with Self-supervised Learning. [Preprint] [Paper]

Experience

- Aug 2023 **Massachusetts Institute of Technology, Center for Brains, Minds and Machines**, Cambridge, USA
Research Fellow | Advisor: *Dr. Andrei Barbu, Dr. Mengmi Zhang*
- Explored representation regularization to mitigate forgetting and improve compositional generalization in continual learning tasks.
 - Built *WorM*, a comprehensive benchmark of 1M trials and 10 tasks, to study working memory in AI systems.
- Oct 2022–
Jun 2024 **Agency for Science, Technology and Research, Institute for Infocomm Research**, Singapore
Research Engineer | Advisor: *Dr. Mengmi Zhang*
- Developed *SeCo*, a self-supervised framework with external memory for context-aware visual reasoning.
 - Developed behavioral benchmarks and controlled evaluation protocols to compare human and AI performance, including multimodal Turing tests and continual learning tasks.
 - Designed and conducted large-scale human psychophysics experiments using Amazon Mechanical Turk, Prolific, and in-lab studies to investigate contextual reasoning, and human learning.
 - Developed curriculum algorithms to optimize continual learning, enhancing forward transfer and reducing catastrophic forgetting.
- Jul 2021–
Aug 2022 **Microsoft Research**, Bangalore, India
Research Intern | Advisor: *Dr. Navin Goyal*
- Developed multimodal models for compositional generalization in grounded language understanding tasks.
 - Worked on the mechanistic interpretability of grounding and composition in multimodal transformers.
 - Explored modular neural networks, enhancing faithfulness of individual reasoning modules.
- Jan 2021–
Jul 2021 **Harvard University, Kreiman Lab**, Cambridge, USA
Research Assistant | Advisor: *Prof. Gabriel Kreiman*
- Explored how question semantics influence attention and grounding in visual question answering models.
 - Investigated the role of co-attention transformer layers in multimodal transformers, comparing model attention with human attention to improve interpretability.

Achievements and Awards

- 2024 **UdeM-Bourse d'exemption**
Awarded the UdeM-Bourse d'exemption grant of CAD 15,149 to pursue graduate studies.
- 2023 **Fujitsu Laboratories Fellowship** [\[Link\]](#)
Received the prestigious Fujitsu Laboratories fellowship for **MIT Center for Brains, Minds and Machines** Summer Program.
- 2021 **First Class with Distinction**
Awarded by Birla Institute of Technology, Mesra, for the Bachelor of Engineering degree.
- 2019 **NASA International Space Apps Challenge — Global Nominee** [\[Link\]](#)
For designing “Prophet: A distributed system for identifying and mitigating lunar dust for future moon missions.”
- 2019 **Bengaluru Tech Summit Global Hackathon — Top 20 Finalists** [\[Link\]](#)
For developing “FOCUS: A Wearable Device for People with Speech and Motor Impairments.”
- 2018 **Siemens MakeIT Real Hackathon — Winner** [\[Link\]](#)
For building the winning prototype “**TetraChrome Lenses**” within 24 hours.

Teaching, Service, and Leadership

- Winter
2026 **Teaching Assistant** | **Mila – Quebec AI Institute, Canada**
• IFT 6765 — Links between Computer Vision and Language, Université de Montréal.
- 2022–present **Academic Service**
- Served as a peer reviewer for top-tier conferences including NeurIPS’25, NeurIPS’23, EMNLP’23, ACL’23, EMNLP’22.
- 2022–2024 **Journal Club Organizer** | **A*STAR Singapore**
- Led reading group at Deep NeuroCognition Lab, inviting speakers, and moderating discussions.

2017–2021 **National Service Scheme | Birla Institute of Technology Mesra**

- Actively participated in STEM outreach programs, mentoring and engaging underprivileged students through hands-on activities and demonstrations.

Invited Talks

Jul 2023 **“Decoding the Enigma: Benchmarking Humans and AIs on the Many Facets of Working Memory”**

- [Libedinsky Lab, National University of Singapore](#) [\[Link\]](#)

Jul 2022 **“When Can Transformers Ground and Compose: Insights from Compositional Generalization Benchmarks”**

- Lab Sabha, [Microsoft Research India](#)