

Divyat Mahajan

Fourth Year Ph.D. Student
Mila, Université de Montréal
Advisor: [Prof. Ioannis Mitliagkas](#)

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Google Scholar

EDUCATION

Université de Montréal
Ph.D. in Computer Science
Advisor: [Prof. Ioannis Mitliagkas](#)

September '22 - August '26 (Expected)
GPA: 4.3/4.3

Université de Montréal
M.Sc. in Computer Science (Research), Specialization: Artificial Intelligence
Advisor: [Prof. Ioannis Mitliagkas](#)

September '21 - August '22
GPA: 4.3/4.3

Indian Institute of Technology Kanpur
B.S. in Mathematics and Scientific Computing
B.Tech in Computer Science and Engineering (Double Major)

July '14 - June '19
GPA: 8.6/10

RESEARCH INTERESTS

Primary: Out-of-Distribution Generalization, Compositional Generalization, Foundational Models
Others: Causal Inference, Object-centric Learning, Amortized & In-context Learning

WORK EXPERIENCE

• **Mila - Research Assistant**
Advisor: [Prof. Ioannis Mitliagkas](#)

September '21 - Present

Projects: Causal Inference, Identifiable Representation Learning, Out-of-Distribution Generalization

• **Meta FAIR Montréal - Visiting Researcher**
Advisor: [Dr. Kartik Ahuja](#) and [Dr. Pascal Vincent](#)

January '24 - Present

Projects: Compositional Generalization, Language Model Pretraining

• **Microsoft Research Cambridge - Research Intern**
Advisor: [Dr. Meyer Scetbon](#) and [Dr. Cheng Zhang](#)

June '23 - September '23

Projects: Amortized Learning, Causal Inference

• **Microsoft Research India - Research Fellow**
Advisor: [Dr. Amit Sharma](#)

July '19 - July '21

Projects: Causal Inference, Counterfactual Explanations, OOD Generalization, Privacy Attacks in ML

• **Aalto University - Research Intern**
Advisor: [Prof. Samuel Kaski](#)

May '18 - July '18

Projects: Approximate Bayesian Computation for Cancer Simulation

• **National University of Singapore - Research Intern**
Advisor: [Prof. Wynne Hsu](#) and [Prof. Lee Mong Li](#)

May '17 - July '17

Projects: Recommender Systems for Side Effect Prediction

PUBLICATIONS (*: EQUAL CONTRIBUTION)

Preprints

• **Amortized Inference of Causal Models via Conditional Fixed-Point Iterations** [\[Link\]](#)
[Divyat Mahajan*](#), Jannes Gladrow, Agrin Hilmkil, Cheng Zhang, Meyer Scetbon*
Under Review

• **Path-specific effects for pulse-oximetry guided decisions in critical care** [\[Link\]](#)
Kevin Zhang, Yonghan Jung, [Divyat Mahajan](#), Karthikeyan Shanmugam, Shalmali Joshi
Under Review

Conference Publications

• **Compositional Risk Minimization** [\[Link\]](#)
[Divyat Mahajan](#), Mohammad Pezeshki, Charles Arnal, Ioannis Mitliagkas, Kartik Ahuja, Pascal Vincent
Proceedings of the International Conference on Machine Learning (ICML '25)

- **Empirical Analysis of Model Selection for Heterogeneous Causal Effect Estimation** [\[Link\]](#)
Divyat Mahajan, Ioannis Mitliagkas, Brady Neal, Vasilis Syrgkanis
Proceedings of the International Conference of Learning Algorithms (ICLR '24) (Spotlight)
- **Additive Decoders for Latent Variables Identification and Cartesian-Product Extrapolation** [\[Link\]](#)
Sébastien Lachapelle*, Divyat Mahajan*, Ioannis Mitliagkas, Simon Lacoste-Julien
Proceedings of the Neural Information Processing Systems (NeurIPS '23) (Oral)
- **Interventional Causal Representation Learning** [\[Link\]](#)
Kartik Ahuja, Divyat Mahajan, Yixin Wang, Yoshua Bengio
Proceedings of the International Conference on Machine Learning (ICML '23) (Oral)
- **Synergies Between Disentanglement and Sparsity: A Multi-Task Learning Perspective** [\[Link\]](#)
Sebastien Lachapelle*, Tristan Deleu*, Divyat Mahajan, Ioannis Mitliagkas, Yoshua Bengio, Simon Lacoste-Julien, Quentin Bertrand
Proceedings of the International Conference on Machine Learning (ICML '23)
- **Towards efficient representation identification in supervised learning** [\[Link\]](#)
Kartik Ahuja*, Divyat Mahajan*, Vasilis Syrgkanis, Ioannis Mitliagkas
Proceedings of the Conference on Causal Learning and Reasoning (CLeaR '22)
- **Domain Generalization using Causal Matching** [\[Link\]](#)
Divyat Mahajan, Shruti Tople, Amit Sharma
Proceedings of the International Conference on Machine Learning (ICML '21) (Oral)
- **Split-Treatment Analysis to Rank Heterogeneous Causal Effects for Prospective Interventions** [\[Link\]](#)
Yanbo Xu, Divyat Mahajan, Liz Manrao, Amit Sharma, Emre Kiciman
Proceedings of the ACM International Conference on Web Search and Data Mining (WSDM '21) (Oral)
- **Towards Unifying Feature Attribution and Counterfactual Explanations: Different Means to Same End** [\[Link\]](#)
Ramaravind Mothilal, Divyat Mahajan, Chenhao Tan, Amit Sharma
Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society (AIES '21)
- **A Generative Framework for Zero-Shot Learning with Adversarial Domain Adaptation** [\[Link\]](#)
Varun Khare*, Divyat Mahajan*, Homanga Bharadhwaj, Vinay Verma, Piyush Rai
Proceedings of the IEEE Winter Conference on Applications of Computer Vision (WACV '20)

Workshop Publications

- **Learning to Defer for Causal Discovery with Imperfect Experts** [\[Link\]](#)
Oscar Clivio, Divyat Mahajan, Perouz Taslakian, Sara Magliacane, Ioannis Mitliagkas, Valentina Zantedeschi, Alexandre Drouin
Workshop on Reasoning and Planning for Large Language Models (ICLR '25)
- **Evaluating Interventional Reasoning Capabilities of Large Language Models** [\[Link\]](#)
Tejas Kasetty, Divyat Mahajan, Gintare Karolina Dziugaite, Alexandre Drouin, Dhanya Sridhar
Workshop on Causality and Large Models (NeurIPS '24)
- **The Connection between Out-of-Distribution Generalization and Privacy of ML Models** [\[Link\]](#)
Divyat Mahajan, Shruti Tople, Amit Sharma
Workshop on Privacy Preserving Machine Learning (NeurIPS '20)
- **Preserving Causal Constraints in Counterfactual Explanations for Machine Learning Classifiers** [\[Link\]](#)
Divyat Mahajan, Chenhao Tan, Amit Sharma
Workshop on Machine Learning and Causal Inference for Improved Decision Making (NeurIPS '19) (Oral)

SOFTWARE

- **RobustDG - Microsoft** [\[Github\]](#) [\[Commit History\]](#)
Core developer for Microsoft's open-source framework for building robust ML models that generalize to unseen domains
- **DiCE - InterpretML** [\[Github\]](#) [\[Commit History\]](#)
Collaborating on the InterpretML's open-source framework to support feasible counterfactual explanation approaches

ACADEMIC SERVICE

- **Reviewer:** ICML 2022-2025, NeurIPS 2021-2025, ICLR 2024-2025, AISTats 2024, TMLR 2025
CleaR 2024-2025, ML RC 2021-2022, MAIS 2022, IEEE SMDS 2021
- **Sub Reviewer:** EMNLP 2021

RESEARCH TALKS

- **Compositional Risk Minimization**
Imperial College London *May' 25*
King's College London *May' 25*
- **Latent Identification and Extrapolation with Additive Decoders**
Microsoft Research India *January' 24*
- **Latent Identification via Interventions**
Microsoft Research Cambridge *July'23*
- **Latent Identification in Multi-Task Learning**
Microsoft Research India *August '22*
CausalML Reading Group, ServiceNow Research *November '22*
Causality Discussion Group, <https://www.matej-zecevic.de/cdg/> *November '23*

AWARDS & ACHIEVEMENTS

- **Oral/Spotlight Conference Publication:** WSDM 2021, ICML 2021, ICML 2023, NeurIPS 2023, ICLR 2024
- **Outstanding/Top Reviewer Award:** ML RC 2021, ML RC 2022, ICML 2022, NeurIPS 2022, NeurIPS 2024
- **FRQNT Scholarship:** Competition 2024-2025
- **Academic Excellence Award, IIT Kanpur:** Academic session 2017-2018
- **Conference Travel Award:** NeurIPS 2019
- **Amii (Upper Bound) Talent Bursary:** Session 2022, 2023, 2024
- **UdeM Accelerated Transition Scholarship:** Academic session 2022-2023, 2023-2024
- **UdeM Exemption Scholarship:** Tuition fee reduction in both the masters and doctorate program

TEACHING AND LEADERSHIP

- (2025) Co-organizing Tea Talks at Mila
- (2024) Volunteered for screening the professional M.Sc. applications at Mila
- (2024) Guest lecturer for two classes of the course IFT 6168 (Causal Inference & ML) at the Université de Montréal
- (2023) Volunteered for screening the M.Sc./Ph.D. applications at Mila
- (2020-21) Managed the Machine Learning Reading Group at Microsoft Research India
- (2018) Project mentor for the course Machine Learning Techniques (CS771A) at IIT Kanpur
- (2018) Mentored 5 students for a project on Recommender Systems under Association of Computing Activities, IITK
- (2017-18) Managed a team of 5 members to publish newsletter Alpha under Statmatics, mathematics society of IITK
- (2016-17) Volunteered in Blood Connect, NGO working to provide a solution for the shortage of blood in India
- (2015-16) Worked in National Service Scheme at IIT Kanpur to provide better education to underprivileged children