Divyam Madaan

Contact Information

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Research Interests

My research focuses on (a) developing methods that harness information from multiple modalities effectively, and (b) improving model's ability to perform consistently in future time periods.

Education

New York University, New York, United States
Ph.D., Computer Science, Courant Institute of Mathematical Sciences — 2021 – Present
- Advisors: Sumit Chopra and Kyunghyun Cho
- GPA: 3.98/4.00

KAIST, Daejeon, Republic of Korea
M.S., School of Computing — 2019 – 2021
- Thesis: Generalizable Robust Deep Learning via Adversarial Pruning and Meta-Noise Generation
- Advisor: Sung Ju Hwang
- Committee: Jinwoo Shin, Eunho Yang
- GPA: 4.21/4.30

Panjab University, Chandigarh, India
B.E. (with Honors) in Information Technology — 2015 – 2019
- GPA: 9.21/10

Work Experience

NVIDIA — Summer 2022
Researcher, with Honxu Yin, Wonmin Byeon, Pavlo Molchanov and Jan Kautz
Explore continual learning on a stream of data with heteregenous architectures.

FOR.ai — 2018 – 2020
Machine Learning Researcher, with Aidan Gomez and Yarin Gal
Explore sparse-ensembles and adversarial robustness to train robust and efficient models.

Celestini Project India — Summer 2018
Research Intern, with Aakanksha Chowdhery and Brejesh Lall
Develop an end-to-end real-time system for multivariate air-pollution forecasting of Delhi.

Google Summer of Code, KDE — Summer 2017
Open Source Contributor, with GCompris
Implement strategic and musical activities to identify the notes and teach the piano instrument.

Honors

CVPR Spotlight (top 10% of submissions)	2023
ICLR Oral (top 1.6% of submissions)	2022
Neural Information Processing System Top Reviewer (top 0.1% of reviewers)	2022 NYU
MacCracken PhD Fellowship	2021 – Present
International Conference on Machine Learning Top Reviewer (top 30% of reviewers)	2020
KAIST International Students Scholarship	2019 – 2021

Conference Publications

[1] **A Framework for Multi-modal Learning: Jointly Modeling Inter- & Intra-Modality Dependencies**
Divyam Madaan, Taro Makino, Sumit Chopra, Kyunghyun Cho
Neural Information Processing Systems (NeurIPS) 2024, Vancouver, Canada.
(acceptance rate = 25.8%)

[2] **Leveraging Historical Patient Reports for Enhanced Automatic Diagnosis**
Haoxu Huang, Cem M. Deniz, Kyunghyun Cho, Sumit Chopra, **Divyam Madaan**,
Machine Learning for Health (ML4H) 2024, Vancouver, Canada.

[3] **Predicting Alzheimer′s Diseases and Related Dementias in 3-year timeframe with AI Foundation Model on Electronic Health Records**
Weicheng Zhu, Huanze Tang, Hao Zhang, Haresh Rengaraj Rajamohan, Shih-Lun Huang, Xinyue Ma, Ankush Chaudhari, **Divyam Madaan**, Elaf Almahmoud, Sumit Chopra, John A Dodson, Abraham A Brody, Arjun V Masurkar, Narges Razavian
Alzheimer′s Association International Conference 2024, Philadelphia, USA.

[4] **Heterogeneous Continual Learning**
Divyam Madaan, Hongxu Yin, Wonmin Byeon, Jan Kautz, Pavlo Molchanov,
Conference on Computer Vision and Pattern Recognition (CVPR) 2023, Vancouver, Canada. (**highlight presentation**) (**acceptance rate = 10%**)

[5] **What Do NLP Researchers Believe? Results of the NLP Community Metasurvey**
Julian Michael, Ari Holtzman, Alicia Parrish, Aaron Mueller, Alex Wang, Angelica Chen, **Divyam Madaan**, Nikita Nangia, Richard Yuanzhe Pang, Jason Phang, Samuel R. Bowman,
Association for Computational Linguistics (ACL) 2023, Toronto, Canada.
(long paper) (acceptance rate = 23.5%)

[6] **On Sensitivity and Robustness of Normalization Schemes to Input Distribution Shifts in Automatic MR Image Diagnosis**
Divyam Madaan, Daniel Sodickson, Kyunghyun Cho, Sumit Chopra,
Medical Imaging with Deep Learning (MIDL) 2023, Nashville, USA.

[7] **Representational Continuity for Unsupervised Continual Learning**
Divyam Madaan, Jaehong Yoon, Yuanchun Li, Yunxin Liu, Sung Ju Hwang,
International Conference on Learning Representations (ICLR) 2022, Online.
(oral presentation) (acceptance rate = 1.6%)

[8] **Online Coreset Selection for Rehearsal-based Continual Learning**
Jaehong Yoon, **Divyam Madaan**, Eunho Yang, Sung Ju Hwang,
International Conference on Learning Representations (ICLR) 2022, Online.
(**acceptance rate = 32.9%**)

[9] **Learning to Generate Noise for Multi-Attack Robustness**
Divyam Madaan, Jinwoo Shin, Sung Ju Hwang,
International Conference on Machine Learning (ICML) 2021, Online.
(**acceptance rate = 21.5%**)

[10] **Adversarial Neural Pruning with Latent Vulnerability Suppression**
Divyam Madaan, Jinwoo Shin, Sung Ju Hwang,
International Conference on Machine Learning (ICML) 2020, Online.
(acceptance rate = 21.8%)

WORKSHOP PRESENTATIONS

[11] **Temporal Fine-tuning of Medical Vision-Language Representations**
Haoxu Huang, Cem M. Deniz, Kyunghyun Cho, Sumit Chopra, **Divyam Madaan**,
Workshop on Medical Imaging meets NeurIPS, 2023, New Orleans, USA.

[12] **Separating Multimodal Modeling from Multidimensional Modeling for Multimodal Learning**
Divyam Madaan, Taro Makino, Sumit Chopra, Kyunghyun Cho,
ICML Workshop on Spurious correlations, Invariance, and Stability 2023,
Hawaii, USA.

[13] **Improving representational continuity via continued pretraining**
Michael Sun, Ananya Kumar, **Divyam Madaan**, Percy Liang,
CVPR Workshop on Continual Learning 2023 (CLVision),
Vancouver, Canada.

[14] **Learning to Generate Noise for Multi-Attack Robustness**
Divyam Madaan, Jinwoo Shin, Sung Ju Hwang
NeurIPS Workshop on Meta-Learning (MetaLearn) 2020, Online.

[15] **Adversarial Neural Pruning**
Divyam Madaan, Jinwoo Shin, Sung Ju Hwang
NeurIPS Workshop on Safety and Robustness in Decision Making 2019, Vancouver, Canada.

PREPRINTS

[16] **Learning Sparse Networks Using Targeted Dropout**
Aidan N. Gomez, Ivan Zhang, Siddhartha Rao Kamalakara, **Divyam Madaan**, Kevin Swersky, Yarin Gal, Geoffrey E. Hinton
Manuscript, 2019

PATENTS

[17] **Techniques for heterogeneous continual learning with machine learning model architecture progression**
Hongxu Yin, Wonmin Byeon, Jan Kautz, **Divyam Madaan**, Pavlo Molchanov
US Patent, 2023

ACADEMIC SERVICE

Journal Reviewer
- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- International Journal of Computer Vision (IJCV)

Conference Reviewer
- International Conference on Artificial Intelligence and Statistics (AISTATS) 2025
- International Conference on Learning Representations (ICLR) 2022 – 2025
- Neural Information Processing System (NeurIPS) 2020 – 2024
- International Conference on Machine Learning (ICML) 2020 – 2024
- Conference on Lifelong Learning Agents (CoLLAs) 2023
- ContinualAI Unconference 2023
- Association for the Advancement of Artificial Intelligence (AAAI) 2021
- Asian Conference on Machine Learning (ACML) 2020

Workshop Reviewer
- Neural Information Processing System Meta-Learning Workshop 2020
- ICML New Frontiers in Adversarial Machine Learning Workshop 2022

Student Volunteer
- International Conference on Machine Learning (ICML) 2020 – 2022
- International Conference on Learning Representations (ICLR) 2020, 2022
- Neural Information Processing System (NeurIPS) 2020, 2022

TEACHING

Natural Language Processing with Representation Learning (DS-GA.1011) Fall 2024
- Prepared and taught three recitations.
- Held office hours, graded, answered questions.

NYU AI School Summer 2023
- Prepared and taught two recitations.
- Held office hours and answered questions.

Causal Inference (DS-GA 3001.003) Spring 2024
- Prepared and taught four recitations.
- Held office hours, graded, answered questions.

Fundamentals of Machine Learning (CSCI-UA 473-1.011) Fall 2023
- Taught three lectures to a class for twenty students.
- Held office hours, prepared problem sets, and answered questions.

Machine Learning for Healthcare (CSCI-GA 3033.083 and DS-GA 3001.002) Fall 2022
- Prepared and taught weekly recitations.
- Held office hours, graded, answered questions.

ADVISING

Research Mentees

- Matthew Dong (BS student at NYU) — 02/2023 – Present
- Haoxu Huang (MS student at NYU → Ph.D. student at NYU) — 02/2023 – Present
- Michael Sun (MS student at Stanford → Ph.D. student at MIT) — 08/2022 – 02/2023

Codementor — 2018 – 2021

Google Summer of Code (university students) — Summer 2018

Google CodeIn (pre-university students) — Winter 2018

Season of KDE (university students) — Winter 2019

INVITED TALKS

Jointly Modeling Inter-& Intra-modality Dependencies for Multi-modal Learning

- DLCT — November 2024
- CILVR Seminar at NYU — March 2024

Representational Continuity for Unsupervised Continual Learning

- ContinualAI — April 2022
- Spotlight talk at ICLR — May 2022

Fooling and Protecting Deep Learning Models, Pydata Conference, India — August 2018

Getting Started with GCompris, KDE India Conference — March 2017