

Divyam Madaan

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Education

KAIST, Republic of Korea

Masters, Computer Science

Sept. 2019 – (Expected) July 2021

GPA: 4.21/4.30

- Supervise by Professors [Sung Ju Hwang](#) and [Jinwoo Shin](#).
- Working on the reliability and scalability of deep neural networks.

Panjab University, India

Bachelor of Engineering With Honours, Information Technology

Aug. 2015 – May 2019

CGPA: 9.21/10

- Fourth position in B.E. program in Information Technology Department (120 students).

Relevant coursework: Machine Learning for AI* (A⁺), Advanced Deep Learning* (A⁺), Advanced Information Security* (A⁺), Design and Analysis of Algorithm* (A⁺), Network Security and Cryptography (A⁺), Operating System (A), Theory of Computation (A), Discrete Mathematics (A⁺), Software Engineering (A⁺)

* indicates graduate level

Research Interests

Adversarial robustness, Network compression, Meta learning, Continual learning, and Representational learning

Publications

Jaehong Yoon, **Divyam Madaan**, Eunho Yang, and Sung Ju Hwang. Online coreset selection for rehearsal-based continual learning, In *submission*, 2021 [[paper](#)]

Divyam Madaan, Jinwoo Shin, and Sung Ju Hwang. Learning to generate noise for multi-attack robustness. In *NeurIPS Workshop on Meta-Learning*, 2020; *ICML 2021* [[paper](#), [video](#)]

Divyam Madaan, Jinwoo Shin, and Sung Ju Hwang. Adversarial neural pruning. In *NeurIPS Safety and Robustness in Decision Making Workshop* 2019; *ICML 2020* [[paper](#), [code](#), [slides](#), [video](#)]

Divyam Madaan*, Radhika Dua*, Prerana Mukherjee, and Brejesh Lall. VayuAnukulani: adaptive memory networks for air pollution forecasting. In *IEEE GlobalSIP*, 2019 [[paper](#), [code](#), [slides](#)]

Aidan N. Gomez, Ivan Zhang, Siddhartha Rao Kamalakara, **Divyam Madaan**, Kevin Swersky, Yarin Gal, and Geoffrey E. Hinton. Learning sparse networks using targeted dropout, 2019 [[paper](#)]

* indicates equal contribution

Experience

- **Memory-efficient data driven algorithms** Jan. 2018 – Present
 - FOR.ai
 - Lead a group of students to conduct research relating to adaptive computation time, and pruning.
 - Currently leading the effort to enhance the diversity and efficiency of sparse ensembles.
- **Multivariate time series forecasting of air pollution** June 2018 – Aug. 2018
 - IIT Delhi
 - Developed attention based architecture for tackling long term dependencies and predictions of different air pollutants.
 - Our work was selected to present at IEEE Global Conference on Signal and Information Processing, 2019.
- **Google Summer of Code, KDE** [[status report](#)] May 2017 – Sept. 2017
 - GCompris
 - Implemented the multi-player mode for Oware, a strategy activity using JavaScript and Qt5.
 - Formulated an activity play piano and notenames to help kids to learn to play piano.
- **Season of KDE** [[code](#)] Nov. 2016 – Feb. 2017
 - GCompris
 - Designed and implemented the categorization activity for images and words with 30 categories using Qt5 and JavaScript.
 - The developed activity is used in a large number of students in Europe to teach the concepts of categorization.

Projects

- **Multi-agent variational reinforcement learning**
KAIST *Oct. 2020 – Present*
 - Working on the improvement of the Variational Inference for Reinforcement learning (ViREL) framework by exploring better estimates of the residual error.
 - Scaling the variational inference framework to multi-agent reinforcement learning.
- **Diversity promoting sparse ensembles**
FOR.ai *Jan. 2020 – Present*
 - Working on the formulation of sparse ensembles by promoting diversity using Information Bottleneck.
 - Scaling up experiments to consider state-of-the-art compression techniques.
- **Adversarial robustness using shake shake regularization**
FOR.ai *Aug. 2018 – Mar. 2019*
 - Worked on a different approaches to emulate the shake shake regularization as an ensemble of networks to reduce the model's sensitivity to small perturbation.
 - Formulated Refusal of Response to refuse the classification of samples with high uncertainty.
- **Adaptive computation time** [code]
FOR.ai *Jan. 2018 – April 2018*
 - Proposed an alternative ponder cost function to the paper Adaptive Computation Time for RNNs by Alex Graves.
 - The proposed new ponder cost relaxes the objective constraints when the model is struggling and achieved higher accuracy and converged faster than the old ponder cost and transitional RNN in various tasks.

Technical and Personal skills

- **Programming Languages:** C, C++, Python, HTML, CSS, Javascript Arduino, \LaTeX
- **Technologies and Frameworks:** Linux, Git, Docker, OpenCV, PyTorch, TensorFlow, Keras, Qt, Django
- **General Business Skills:** Good presentation skills, Work well in a team

Leadership and Mentoring Experience

- **Codementor** *Sept. 2018 – Dec. 2020*
Mentor at Codementor
- **Mentor** *Dec. 2017 – Jan. 2019*
Mentored students for Google Summer of Code, Google CodeIn, and Season of KDE
- **Programming Club** *Aug. 2017 – Sept. 2018*
Founded the community which has grown to 700+ members.
- **Software Freedom Day** *Sept. 2017*
Co-organizer and speaker at Software Freedom Day.

Talks

- **Pydata Conference** *Aug. 2018*
Fooing and protecting deep learning models [video]
- **KDE India Conference** *March 2017*
Getting started with GCompris.

Service

- **Journal Reviewer**
IEEE Transactions on Pattern Analysis and Machine Intelligence
- **Conference Reviewer**
ICML (2020 – Top 33%, 2021), ACML 2020, NeurIPS (2020, 2021), AAAI 2021
- **Workshop Reviewer**
NeurIPS Meta-Learning Workshop 2020
- **Volunteer**
ICLR 2020, ICML 2020, NeurIPS 2020