MRIGANK RAMAN

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EDUCATION

Carnegie Mellon University — *Pittsburgh, PA*
Master of Science in Machine Learning (MSML) — *December 2023 (expected)*

Indian Institute of Technology, Delhi — *New Delhi, India*
Bachelor of Technology in Mathematics & Computing | Overall GPA: 9.68/10 — *May 2021*

PUBLICATIONS

Conference Publications

1. Domain Generalization via Inference-time Label-Preserving Target Projections (***Oral***)
   Prashant Pandey, **Mrigank Raman**, Sumanth Varambally, Prathosh AP
   *34th Conference on Computer Vision and Pattern Recognition, 2021 (**CVPR 2021**)*

2. Learning to Deceive Knowledge Graph Augmented Models via Targeted Perturbation
   Mrigank Raman, Hansen Wang, PeiFeng Wang, Siddhant Agarwal, Sungchul Kim, Ryan Rossi, Handong Zhao, Nedim Lipka, Xiang Ren
   *9th International Conference on Learning Representations, 2021 (**ICLR 2021**)*

3. Learning Contextualized Knowledge Structures for Commonsense Reasoning
   Jun Yan, **Mrigank Raman**, Aaron Chan, Tianyu Zhang, Ryan A. Rossi, Handong Zhao, Sungchul Kim, Nedim Lipka, Xiang Ren
   *The Joint Conference of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing, 2021 (**ACL 2021**)*

4. Centralized Active Tracking of a Markov Chain with Unknown Dynamics
   Mrigank Raman, Ojal Kumar, Arpan Chattopadhyay
   *17th IEEE International Conference on Mobile Ad-Hoc and Smart Systems, 2020 (**MASS 2020**)*

Workshop Publications

1. Learning to Deceive Knowledge Graph Augmented Models via Targeted Perturbation
   Mrigank Raman, Siddhant Agarwal, Peifeng Wang, Xiang Ren
   34th Conference on Neural Information Processing Systems, 2020 KR2ML Workshop
   Best paper runner-up

2. Learning Contextualized Knowledge Structures for Commonsense Reasoning
   Jun Yan, **Mrigank Raman**, Tianyu Zhang, Ryan A. Rossi, Handong Zhao, Sungchul Kim, Nedim Lipka, Xiang Ren
   34th Conference on Neural Information Processing Systems, 2020 KR2ML Workshop

SELECTED RESEARCH PROJECTS

Domain Generalization for Image Classification — June 2020 - November 2020
Advisor: Dr. Prathosh AP, IIT Delhi

- Learned a domain-agnostic and label preserving feature space using a contrastive loss formulation
- Used a generative model to project the target features onto the source feature manifold to improve generalizability
- Acheived SOTA results on PACS, VLCS, Office-Home, Digits-DG and CIFAR-10-C datasets

Learning to Deceive Knowledge Graph based models May 2020 - February 2021
Advisor: Dr. Xiang Ren, USC Viterbi

- Performed different types of perturbations on the semantics and connectivity of the Knowledge Graph using RL and heuristics.
- Demonstrated that symbolic structures are not learnt in a manner humans expect them to.
- Highlighted the implausibility and unfaithfulness of explanations generated by the neural symbolic models.

WORK EXPERIENCE

FedML Inc Los Angeles, CA | May 2022 - August 2022
Research Intern

- Implemented the FedNLP open source and MLOps application supporting a variety of NLP tasks
- Worked on lightweight tuning methods for training Language models on resource constrained devices

Quadeye Gurugram, India | June 2021 - May 2022
Quantitative Researcher

- Devised a new profitable strategy for index options and improved existing currency option strategy
- Implemented different alphas for improving existing stock option strategy and reduce losses

SELECTED AWARDS AND HONORS

- Conferred with the **Institute Silver Medal** for securing the highest GPA in the whole Mathematics Department.
- Awarded with the Institute Merit award for being amongst **Top 7%** students of the entire batch for 6 out of 8 semesters.
- Was **one** amongst 14 students from all over India to be awarded with the **IUSSTF-Viterbi India 2020 scholarship**.
- Secured an All India Rank of **183** in the Joint Entrance Examination amongst 1.2 million candidates
- Selected to join the first **AI Summer School** hosted by Google Research India in 2020
- Awarded the prestigious KVPY Fellowship in 2016 with an All India Rank of **222**

TEACHING

- Teaching Assistant for UG course on Algebra; responsible for taking doubt sessions and make question papers
- Teaching Assistant for UG course on Real Analysis; responsible for taking doubt sessions and make question papers

TECHNICAL STRENGTHS

Computer Languages	C/C++, Java, Python, MATLAB
Frameworks	Pytorch, Tensorflow, Caffe, OpenAI Gym

RELEVANT COURSES

Mathematics : Probability and Stochastic Processes, Statistical Methods, Optimization Methods, Functional Analysis, Linear Algebra and Applications, Numerical Methods, Abstract Algebra, Real and Complex Analysis, Differential Equations, Discrete Mathematics, Calculus, Number Theory

Computer Science : Machine Learning, Data Structures and Algorithms, Theory of Computation, Analysis and Design of Algorithms, Computer Architecture, Digital Logic, Introduction to Programming, Signals and Systems, Operating Systems, Data Mining

Graduate Level : Advanced Machine Learning, Special Topics in Database Management Systems, Natural Language Processing, Cryptography and Computer Security, Digital Image Analysis, Information Retrieval, Graph Theory, Multivariate Statistical Methods, Fractal Geometry