Nupur Kumari

Graduate Student
Robotics Institute
Carnegie Mellon University

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Education

Robotics Institute, Carnegie Mellon University, USA
PhD in Robotics — 2022 - Present
MS in Robotics (GPA: 4.17/4.3) — 2021 - 2022

Indian Institute of Technology Delhi, India — 2012 - 2017
Integrated M. Tech in Mathematics and Computing (GPA: 9.15/10.0)

Selected Publications

- **Nupur Kumari**, Richard Zhang, Eli Shechtman, Jun-Yan Zhu. *Ensembling Off-the-shelf Models for GAN Training.* **CVPR** 2022 Oral (paper link)

- **Nupur Kumari***, Mayank Singh*, Puneet Mangla, Abhishek Sinha, Balaji Krishnamurthy, Vineeth N Balasubramanian. *Attributional Robustness Training using Input-Gradient Spatial Alignment.* **ECCV** 2020 (paper link)

- Puneet Mangla*, **Nupur Kumari***, Mayank Singh*, Abhishek Sinha*, Balaji Krishnamurthy, Vineeth N Balasubramanian. *Charting the Right Manifold: Manifold Mixup for Few-shot Learning.* **WACV** 2020. Spotlight at **NeurIPS MetaLearn workshop** 2019. (paper link)

- **Nupur Kumari***,Siddarth Ramesh*, Akash Rupela*, Piyush Gupta*,Balaji Krishnamurthy. *ShapeVis: High-dimensional Data Visualization at Scale.* **WWW** 2020 (paper link)

- **Nupur Kumari***, Mayank Singh*, Abhishek Sinha*, Harshitha Machiraju, Balaji Krishnamurthy, Vineeth N Balasubramanian. *Harnessing the Vulnerability of Latent Layers in Adversarially Trained Models.* **IJCAI**. 2019. (paper link)

Other Publications

- Puneet Mangla*, **Nupur Kumari***, Mayank Singh*, Balaji Krishnamurthy, Vineeth N Balasubramanian. *Data Instance Prior (DISP) in Generative Adversarial Networks.* **WACV** 2022 (paper link)

- Parth Patel*, **Nupur Kumari***, Mayank Singh*, Balaji Krishnamurthy. *LT-GAN: Self-Supervised GAN with Latent Transformation Detection.* **WACV** 2021 (paper link)

- Gunjan Aggarwal, Abhishek Sinha, **Nupur Kumari**, Mayank Singh. *On the Benefits of Models with Perceptually-Aligned Gradients.* Towards Trustworthy ML **ICLR workshop**, 2020. (paper link)

- Bishal Deb, Ankita Sarkar, **Nupur Kumari**, Akash Rupela, Piyush Gupta, Balaji Krishnamurthy. *MultiMapper: Data Density Sensitive Topological Visualization.* **ICDM workshop**, 2018. (paper link).

(* denotes equal contribution)

US Patents

- **Nupur Kumari**, Balaji Krishnamurthy, Piyush Gupta, Akash Rupela. **Facilitating machine-learning and data analysis by computing user-session representation vectors.** *US15/486,862.* (Active)
- Bishal Deb, Ankita Sarkar, **Nupur Kumari**, Akash Rupela, Piyush Gupta, Balaji Krishnamurthy. **Generating varied-scale topological visualizations of multi-dimensional data.** *US16/368,415.* (Active)
- Pankhri Singhai, Sundeep Parsa, Piyush Gupta, **Nupur Kumari**, Nikaash Puri, Mayank Singh, Eshita Shah, Balaji Krishnamurthy, Akash Rupela. **Machine-Learning Based Multi-Step Engagement Strategy Modification.** *US16/057,743.* (Active)
- **Nupur Kumari**, Piyush Gupta, Akash Rupela, Siddarth R, Balaji Krishnamurthy. **Generating a high-dimensional network graph for data visualization utilizing landmark data points and modularity-based manifold tearing.** *US16/850,677* . (Filed)

Work Experience

Adobe Systems, Noida, India July 2017-Jan 2021
Media and Data Science Reasearch lab

Adobe Systems, Noida, India May-July 2016
Research Intern

Curofy, Grugaon, India May-July 2015
Software Development Intern

Other Projects

- **Universal adversarial attack** May-Aug 2019
  We worked on developing a fast data independent technique of computing class-wise universal adversarial perturbation for classification neural networks by approximating the non-linear layers with a linear function. (project arxiv link)
- **Natural Language Processing** Jan-April 2016
  Implemented a sentiment classifier for predicting sentiments expressed in the tweet specific to a personality. Used domain adaptation techniques to exploit large amount of labelled tweet data in one domain and few domain specific labels. Also worked on attention based hierarchical seq2seq model for abstractive summarization of movie reviews.

Achievements

- Qualified for **INMO (Indian National Mathematics Olympiad)** 2012 organized by HBSCE by securing second position in the region and 19 overall in India in JMO (Junior Mathematics Olympiad). 2011
- Recipient of highest CGPA in semester award for two semesters at IIT Delhi. 2016-2017

Other initiatives and leadership roles

- **Graphics Seminar at CMU.** Oct 2021-Present
  - responsible for organizing weekly graphics seminar and inviting internal and external speakers for presenting their recent research in graphics and vision.
- **Mentor of internship projects at Adobe** May-July 2018,2019
  - **Topological features for Deep Learning.** The project aimed at exploring the use of persistent homology based features of data for predicting network architecture.
  - **Natural Language Paraphrasing.** We explored Variational Autoencoder based architecture with iterative decoding for paraphrase generation on MS COCO and Quora Question Pairs dataset.
- **Teaching Assistantship** 2016,2017
  - **Discrete Mathematics, Data Mining, and Linear Algebra.** Responsible for assignment evaluation and conducting tutorial sessions for the courses at IIT Delhi.
  - **Machine Learning course on classification and deep learning.** Served as a teaching instructor for a Machine Learning course that was offered to employees at Adobe.
- **Electrical coordinator at Robotics Club IIT Delhi** 2014-2015
  - Responsible for guiding a team of 10 students in building the drive and circuit of a remote controlled robot that can play badminton. We participated in Abu-Robocon India 2015 competition and qualified for the quarter-finals round among more than 60 participating teams. We received the *Best Innovation Award* at the competition.

Relevant Courses

Graduate:
Intro to Machine Learning
Computer Vision
Compuatational Photography

Undergraduate:
Digital Image Processing
Principles of Artificial Intelligence
Computational Perception and Cognition

Languages and frameworks

Proficient: Python, Pytorch, Tensorflow

Familiar: C++, Java, Julia