

Ramnath Kumar

◇ ramnathkumar181.github.io  ◇ [Google Scholar](#)  ◇

RESEARCH INTERESTS & SUMMARY

My research interests broadly span deep learning, with a focus on designing **robust** and **efficient** techniques for building practical deep learning systems. I am particularly interested in representation learning and the optimization of training paradigms for such models.

EDUCATION

University of California, Los Angeles (UCLA)

USA

PhD. in Computer Science

09/2024 – Present

. Mentor: [Cho-Jui Hsieh](#)

BITS Pilani, Hyderabad Campus

India

B.E. in Computer Science, and MSc. in Economics

08/2016 – 08/2021


SELECTED RESEARCH/WORK EXPERIENCE

Google DeepMind

India

Pre-Doctoral Researcher at Google

07/2022 – 08/2024

- . Mentors: [Prateek Jain](#) and [Inderjit S. Dhillon](#)
- . Led a cross-functional team in developing and deploying RGD in product-driven research, improving performance of ViT by up to **1.01%** on ImageNet-1K [1].
- . Developed an End-to-End efficient retrieval architecture (EHI), that improved upon prior retrieval benchmarks by up to **1.45%** at a fixed compute budget. This effort is slated for integration into various Google products [2].
- . Received recognition for efforts in improving related product retrieval for users across the world. Took initiative in proposing a novel end-to-end retrieval architecture, improving efficiency and robustness in ongoing projects, with contributions recognized in .

Google Research

India

Research Associate at Google

04/2022 – 07/2022

- . Mentor: [Dheeraj Nagaraj](#)
- . Developed Introspective Experience Replay (IER), a novel replay buffer sampling strategy inspired by Reverse Experience Replay (RER), demonstrating up to **7×** faster convergence in Reinforcement Learning algorithms such as DQN and TD3 [5].

Mila - Quebec Artificial Intelligence Institute

Canada

Consultant

07/2021 – 03/2022

. Mentor: [Yoshua Bengio](#)

- . Initiated and led a project exploring the impact of diversity in meta-learning, collaborating closely with his group. Designed and executed experiments, leading to an oral presentation at the “*Association for the Advancement of Artificial Intelligence*” (AAAI) that challenged the conventional wisdom of diversity being strictly useful to meta-learning [3].

Amazon ML

India

Applied Scientist Intern



01/2021 – 06/2021

. Mentor: [Gokul Swamy](#)


- . Led a study on causal attribution within Amazon’s sales model as first author, with findings presented at Amazon’s internal conference (AMLC 2021).

- Mentors: [Amit P. Sheth](#) and [Krishnaprasad Thirunarayan](#)
- Collaborated with a cross-functional research team across multiple time zones as first author on the *eDarkFind* project, where I developed an unsupervised multi-view framework for Sybil detection, specifically targeting Darknet market activities [4].

PUBLICATIONS

- [1] [Stochastic Re-weighted Gradient Descent via Distributionally Robust Optimization](#)
Ramnath Kumar, Kushal Alpesh Majmundar, Dheeraj Mysore Nagaraj, and Arun Suggala
Transactions on Machine Learning Research, 2024.
[Google AI Blog Coverage](#).
- [2] [EHI: End-to-end Learning of Hierarchical Index for Efficient Dense Retrieval](#)
Ramnath Kumar*, Anshul Mittal*, Nilesh Gupta, Aditya Kusupati, Inderjit Dhillon, and Prateek Jain
Transactions on Machine Learning Research, 2024.
- [3] [The Effect of diversity in Meta-Learning](#) 
Ramnath Kumar, Tristan Deleu, and Yoshua Bengio
Association for the Advancement of Artificial Intelligence (AAAI), 2023 (**Oral Paper**).
[SynchedReview Blog Coverage](#).
- [4] [eDarkFind: Unsupervised Multi-view Learning for Sybil Account Detection](#) 
Ramnath Kumar, Shweta Yadav, Raminta Daniulaityte, Francois Lamy, Krishnaprasad Thirunarayan, Usha Lokala, and Amit Sheth
The Web Conference (WWW), 2020.
- [5] [Introspective Experience Replay: Look Back When Surprised](#) 
Ramnath Kumar and Dheeraj Nagaraj
Transactions on Machine Learning Research, 2024.
[Google Research Blog Coverage](#).
- [6] [Rethinking Learning Dynamics in RL using Adversarial Networks](#) 
Ramnath Kumar, Tristan Deleu, and Yoshua Bengio
NeurIPS Workshop on DeepRL, 2022.
- [7] [Temporal Dynamics and Spatial Content in IoT Malware detection](#) 
Ramnath Kumar and G Geethakumari
IEEE TENCON, 2019.

SELECTED AWARDS AND HIGHLIGHTS

Quad Fellowship , Participated in a summit at the White House to discuss the role of emergent technologies and their policies 	2024
Graduate Dean's Scholars Award , UCLA scholarship.	2024
Awardee , NTSE Scholar.	2014-2020