

Ramnath Kumar

Email  Website  Github  LinkedIn  Scholar 

Research Interests

- **Generalization:** AI that can generalize concepts and is robust to i.i.d. as well as o.o.d. data distribution.
- **Causality:** Fundamentals of causality to interpret the decision process of black-box algorithms.
- **Theoretical Machine Learning:** AI with convergence guarantees, covering problems from the domains of optimization, game theory, and statistics.
- **Real-world representation Learning:** AI that can learn fair, robust, efficient and generalizable representations with applications in language, vision, speech, robotics, healthcare, and education.

EDUCATION

BITS Pilani, Hyderabad Campus

Masters of Science in Economics

Bachelor of Engineering in Computer Science

Hyderabad, India

Aug 2016 – Jun 2021

- . Achieved overall distinction in Computer Science courses.
- . CGPA in Computer Science major: **9.65/10.0** (Top 10 in class of 255)
- . Overall CGPA (B.E. Computer Science and Msc. Economics): 8.92/10.0

RESEARCH/WORK EXPERIENCE

Google

Pre-Doctoral Researcher

Bangalore, India

Jul 2022 – Present

- . Research Supervisor: [Prof. Prateek Jain](#) and [Prof. Inderjit S. Dhillon](#)
- . Machine Learning and Optimization Group & Ads ML Team

Research Associate

Apr 2022 – Jul 2022

- . Research Supervisor during: [Dr. Dheeraj Nagaraj](#)
- . Machine Learning and Optimization Group

Mila - Quebec Artificial Intelligence Institute

Consultant

Montreal, Canada

Jul 2021 – March 2022


- . Research Supervisor: [Prof. Yoshua Bengio](#)
- . Topic: Deep learning algorithms; Meta-Learning

Amazon ML

Applied Scientist Intern

Bangalore, India

Jan 2021 – Jun 2021


- . Mentor: Dr. Gokul Swamy
- . Topic: Stochastic Insight into Neural Networks 
- . Published at Amazon's internal conference (AMLC 2021) as the first author. Worked on causal attributions and their implications on the Amazon sales model.

Mila - Quebec Artificial Intelligence Institute

Research Intern

Montreal, Canada

Nov 2020 – Apr 2021

- . Research Supervisor: [Prof. Samira E. Kahou](#)
- . Affiliated University: École de technologie supérieure
- . Topic: Theoretical machine learning in the domain of graph neural networks 

Qubole

Engineer Intern

Bangalore, India


Jul 2020 – Dec 2020

- . Mentor: Gururaj Krishnamurthy
- . Worked on automating the rollout process (*Frost 2.0*) for the company
- . Built a package for monitoring jobs on jenkins, and notify the user on slack upon completion

- . Wrote and managed a pipeline which analyses various internal tests, and generates ad statistics and communicated results with the core-qa team


CoCo Lab, Université de Montréal
Research Intern

Montreal, Canada
 Jun 2020 – Nov 2020

- . Research Supervisor: [Prof. Karim Jerbi](#)
- . Topic: Brain based subject identification using EEG data 





Kno.e.sis, Wright State University
Research Intern

Dayton, USA
 May 2019 – August 2019

- . Research Supervisor: [Prof. Amit P. Sheth](#) and [Prof. Krishnaprasad Thirunarayan](#)
- . Topic: eDarkFind: Unsupervised Multi-View Learning for Sybil account detection 
- . Worked on sybil detection in the darknet markets using an unsupervised multi-view learning framework.
- . Worked on object detection models for disaster management.
- . Built an image segmentation model to aid the prediction of nutritional data of food.
- . Worked on GANs and NLP to detect suicidal posts in *Suicide Watch* and *Mental Health* subreddits.

BITS Pilani, Hyderabad Campus
Undergraduate Research Assistant

Hyderabad, India
 July 2018 – Jun 2020

- . *Machine Learning in Malware detection in IoT* under [Prof. Geethakumari](#) 
- . *Machine Learning in Astronomy* under [Prof. Rahul Nigam](#) 
- . *Machine Learning in P2P Lending* under [Prof. Hussain Yaganti](#) 
- . *R-Package for Inequality with Ordinal Data* under [Prof. Bheemeshwar Reddy](#) 

Infibeam
Engineer Intern





Ahmedabad, India
 May 2018 – July 2018





- . Mentor: Paras Pitroda
- . Developed a dynamic portal for UAE to provide various services such as renew the visa, employment letter, etc.
- . Created API endpoints for the project to aid easy app deployment.

SELECTED AWARDS/ACHIEVEMENTS

Invitee , Eastern European Machine Learning Summer School, Vilnius Lithuania (EEML) (Also selected to present [2] at a Poster Session.)	2022
Invitee , <i>ML Foundations</i> ; Research Week with Google, India	2022
Invitee , Machine Learning Summer School, Taipei	2021
Invitee , Google AI Summer School, India (Acceptance Rate: 1.5%)	2020
Awardee , INSPIRE Scholar (Acceptance Rate: 1%) (Declined)	2016-2021
Awardee , NTSE Scholar (Awarded to 775 students amongst 0.5 million candidates)	2014-2020
National Olympiad , SOF National Science Olympiad Qualifier (2015), SOF International Math Olympiad Qualifier (2015)	

PUBLICATIONS

- [1] **Ramnath Kumar** and Dheeraj Nagaraj. “[Look Back When Surprised: Stabilizing Reverse Experience Replay for Neural Approximation](#)”. In: *arXiv preprint arXiv:2206.03171* (2022). **Under Review** .
- [2] **Ramnath Kumar**, Tristan Deleu, and Yoshua Bengio. “[Rethinking Learning Dynamics in RL using Adversarial Networks](#)”. In: *arXiv preprint arXiv:2201.11783* (2022). **Under Review** .
- [3] **Ramnath Kumar**, Tristan Deleu, and Yoshua Bengio. “[The Effect of diversity in Meta-Learning](#)”. In: *AAAI* (2023). **(Oral)** .
- [4] **Ramnath Kumar** and Dheeraj Nagaraj. “[Look Back When Surprised: Stabilizing Reverse Experience Replay for Neural Approximation](#)”. In: *NeurIPS Workshop on DeepRL* (2022). .

- [5] **Ramnath Kumar**, Tristan Deleu, and Yoshua Bengio. “[Rethinking Learning Dynamics in RL using Adversarial Networks](#)”. In: *NeurIPS Workshop on DeepRL* (2022). .
- [6] **Ramnath Kumar**, Tristan Deleu, and Yoshua Bengio. “[Effect of diversity in Meta-Learning](#)”. In: *NeurIPS Workshop on Meta-Learning*. 2021. .
- [7] **Ramnath Kumar**, Shweta Yadav, Raminta Daniulaityte, Francois Lamy, Krishnaprasad Thirunarayan, Usha Lokala, and Amit Sheth. “[eDarkFind: Unsupervised Multi-view Learning for Sybil Account Detection](#)”. In: *Proceedings of The Web Conference 2020*. 2020, pp. 1955–1965. .
- [8] **Ramnath Kumar** and G Geethakumari. “[Temporal Dynamics and Spatial Content in IoT Malware detection](#)”. In: *TENCON 2019-2019 IEEE Region 10 Conference (TENCON)*. IEEE. 2019, pp. 1590–1595. .

PROFESSIONAL SERVICE

Reviewer

ICLR	2023
NeurIPS	2022
ICML	2022,2023
AutoML	2022
NeurIPS, MetaLearn Workshop	2021,2022
ICWSM	2020,2022,2023

RELEVANT COURSEWORK

MATH-F111 , Calculus	by K.V. Ratnam
MATH-F112 , Linear Algebra	by P.K. Sahoo
MATH-F113 , Probability and Statistics	by D.K. Satpathi
MATH-F211 , Differential Equations	by T.S.L. Radhika
CS-F320 , Foundations of Data Science	by N.L. Bhanumurthy
CS-F407 , Artificial Intelligence	by Chittaranjan Hota
CS-F464 , Machine Learning	by N.L. Bhanumurthy
CS-F469 , Information Retrieval	by Aruna Malapati
Udemy , Deep Learning A-Z	by Kirill Eremenko
Coursera , Neural Networks and Deep Learning	by Andrew NG
Coursera , Improving Deep Neural Networks	by Andrew NG
Coursera , Structuring Machine Learning Projects	by Andrew NG
Coursera , Convolutional Neural Networks	by Andrew NG
Coursera , Sequence Models	by Andrew NG

LANGUAGES

English (Native/Fluent), Hindi (Experienced), Tamil (Experienced), Japanese (Beginner)