Parikshit Ram
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Education & Training

Georgia Institute of Technology	Atlanta, GA	Computer Science	Ph.D., 2013
Georgia Institute of Technology	Atlanta, GA	Optimization	Minor, 2013
Indian Institute of Technology	Kharagpur, India	Mathematics & Computing	M.Sc., 2007
Indian Institute of Technology	Kharagpur, India	Mathematics & Computing	B.Sc., 2006

Research & Professional Experience

2018 – present	Principal Research Staff Member, IBM Research
2017 – 2018	Principal Product Architect, Infosys Ltd
2015 – 2017	Senior Staff Research Scientist, Skytree Inc
2013 – 2015	Member of Technical Staff, Skytree Inc

Research Interests

I have a wide range of research interests, and I am always excited to learn about new areas and make connections between different areas. In this process, I have spent some time focusing on the following areas: Optimization (single and bilevel), Automated Machine Learning & Data Science, Large Scale Learning, Computational Geometry, Efficient All-Pairs Algorithms & Analysis, Density Estimation, Kernel Methods, Associative Memories & Energy-based Models, Machine Unlearning, Sparse Learning, Neuro-inspired Learning, Compositional Generalization.

Selected Publications

I have been fortunate to publish in various research areas at top AI, Machine Learning and Data Mining conferences with a h-index of 23. I have also filed 20+ patents. The following are some of my selected publications (see full list of papers and papers here)

. Jia, J., Liu, J., **Ram, P.**, Yao, Y., Liu, G., Liu, Y., Sharma, P., Liu, S. (2023). Model Sparsity can Simplify Machine Unlearning. *Advances in Neural Information Processing Systems*.
. Saha, B., Krotov, D., Zaki, M. J., **Ram, P.** (2023). End-to-end Differentiable Clustering with Associative Memories. *International Conference on Machine Learning*.
. Gu, A., Lu, S., **Ram, P.**, Weng, T.-W. (2023). Min-max Bilevel Multi-objective Optimization With Applications In Machine Learning. *International Conference on Learning Representations*.
. Zhou, Y., **Ram, P.**, Salonidis, T., Baracaldo, N., Samulowitz, H., Ludwig, H. (2023). Single-shot General Hyper-parameter Optimization for Federated Learning. *International Conference on Learning Representations*.
. Zhang, Y., Yao, Y., **Ram, P.**, Hong, M., Varshney, K., Liu, S. (2022). Advancing Model Pruning via Bilevel Optimization. *Advances in Neural Information Processing Systems*.
. Teng, Y., Choromanska, A., Campbell, M., Lu, S., **Ram, P.**, Horesh, L. (2022). Overcoming Catastrophic Forgetting via Direction-Constrained Optimization. *European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases*.
. **Ram, P.**, and Sinha, K. (2022). Federated Nearest Neighbor Classification with a Colony of Fruit-flies. *Proceedings of the AAAI Conference on Artificial Intelligence*.
. Liu, S., **Ram, P.**, Vijaykeerthy, D., Bouneffouf, D., Bramble, G., Samulowitz, H., Wang, D., Conn, A., Gray, A. (2020). An ADMM based framework for AutoML pipeline configuration. *Proceedings of the AAAI Conference on Artificial Intelligence*.
. **Ram, P.**, and Sinha, K. (2019). Revisiting `kd`-tree for Nearest Neighbor Search. *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*.
. Curtin, R. R., Cline, J. R., Slagle, N. P., March, W. B., **Ram, P.**, Mehta, N. A., and Gray, A. G. (2013). MLPACK: A scalable C++ machine learning library. *Journal of Machine Learning Research*
. Curtin, R. R., **Ram, P.**, and Gray, A. G. (2013). Fast Exact Max-kernel Search. *SIAM International Conference on Data Mining*.

. **Ram, P.** and Gray, A. G. (2012). Maximum Inner-Product Search using Cone Trees. *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*.
. **Ram, P.** and Gray, A. G. (2011). Density Estimation Trees. *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*.
. March, W. B., **Ram, P.**, and Gray, A. G. (2010). Fast Euclidean Minimum Spanning Tree: Algorithm, Analysis, and Applications. *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*.
. **Ram, P.**, Lee, D., March, W., and Gray, A. (2009). Linear-time Algorithms for Pairwise Statistical Problems. *Advances in Neural Information Processing Systems*.

Recognition

- IBM Research Accomplishments: *Towards Automating AI Lifecycle with AutoAI* (2019). *AutoAI: The Next Level* (2020). *Federated Learning Security & Privacy* (2022). *Neurobiologically Inspired Foundation Models* (2023).
- TMLR 2023 Expert Reviewer. NeurIPS Top Reviewer 2022, 2023. ICML Top Reviewer 2022.
- IBM Invention Plateau 1 (May 2020) - 5 (January 2024).
- IBM Research 2020 Pat Goldberg Best Paper Finalist for *An ADMM based Framework for AutoML Pipeline Configuration*.
- SIAM Data Mining 2013 Best Paper Finalist for *Fast Exact Max-Kernel Search*.

Service

- Organizer, NeurIPS 2023 Workshop on *Associative Memory and Hopfield Networks*.
- Senior PC member AAAI 2024, 2025. NeurIPS Area Chair 2024. ICML Area Chair 2025.
- Office-hours, ICLR 2023.
- Organizer, KDD 2022 Tutorial on Gradual AutoML using Lale.
- Regular PC member for top AI/ML conferences NeurIPS, ICML, AISTATS, ICLR, UAI, KDD, AAAI.

Invited Talks

- *(Upcoming)* Dense Associative Memories through the Lens of Random Features, **VSAONLINE, June 2025**.
- *(Upcoming)* Associative Memories and its Role in Machine Learning, **ICLR 2025** workshop on *New Frontiers in Associative Memories*.
- The Critical Role of Fundamental Mathematical Tools on the Path to AGI, **IIITDM Kancheepuram** 2024 workshop on *Future Perspectives of AI and Data Sciences : Algorithms and Applications*. [video]
- Robust Multi-objective Bilevel Optimization With Applications In Machine Learning, **INFORMS 2022** session on *Bilevel Stochastic Methods for Optimization and Learning*.
- Density Estimation Trees, **SIAM Uncertainty Quantification 2014 (UQ14)** mini-symposium on *Non-parametric Density Estimation*.
- Max-kernel Search: How to search for just about anything?, **MLConf Atlanta 2014**. [video]

Teaching

- Bilevel Optimization at the *Polyhedra and Combinatorial Optimization Days 2023 (JPOC13) summer school on Combinatorial Optimization & Machine Learning*.
- Compositional Generalization at the *Neuro-Symbolic Summer School 2023*.
- Hands-on tutorial at the *KDD 2022 Tutorial on Gradual AutoML using Lale*.
- Teaching Assistant, *Data and Visual Analytics (Spring 2011, 2013)*, Georgia Tech.

Research Grants

- Co-PI, *Fast Inference and Alignment for Large Multi-modal Models*, RPI-IBM Future of Computing Research Collaboration Program, 2025
- Co-PI, *Meta-Transfer-Learning for Tabular Data Distillation, Generation, and Predictive Modeling*, RPI-IBM Future of Computing Research Collaboration Program, 2025
- Co-PI, *FIT: Fast Inference using Transformer Models*, RPI-IBM Future of Computing Research Collaboration Program, 2024
- Co-PI, *Data Distillation in Tabular Data: A Foundation Model Approach*, RPI-IBM Future of Computing Research Collaboration Program, 2024
- Co-PI, *A Framework for Automating Decentralized Training of Foundation Models*, RPI-IBM AI Research Collaboration Program, 2023
- Co-PI, *AutoDML: A Framework for Automating Decentralized Machine Learning*, RPI-IBM AI Research Collaboration Program, 2022

Mentorship

I have mentored students both during summer internships at IBM research, and through continued collaborations with their advisors at various academic institutions.

Continuing projects

- Ben Hoover (GT), 2024-current.
- Inwon Kang (RPI), 2023-current.
- Jinghan Jia (MSU), 2023-present.
- Bishwajit Saha (RPI), 2022-2024.
- Momin Abbas (RPI), 2022-2023.
- Jiancheng Liu (MSU), 2022-current.
- Yuguang Yao (MSU), 2020-present.
- Yihua Zhang (MSU), 2020-present.
- Yunfei Teng (NYU), 2020-2022.

Summer interns at IBM

- Inwon Kang (RPI) 2023, 2024
- Charlotte Park (MIT) 2024
- Momin Abbas (RPI) 2023
- Bishwajit Saha (RPI) 2022, 2023
- Xinying Qi (RPI) 2022, 2023
- Lucky Yerimah (RPI) 2021

Undergraduate researchers at MIT-IBM

- Alex Gu (MIT) 2021