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| CONTACT | Webpage: http://karthikabinavs.xyz Email: karthikabinavs@gmail.com | |
| INTERESTS | LLMs & AI Foundations, Applications and Systems: Sequential Decision Making, Sequential Deep Learning, Optimization, Matching-based Market Design (Rideshare, Online Advertising, Modern Rec Sys), AI for Society (Fairness, Integrity, Climate Change), Large Scale ML Systems, Generative AI. | |
| EDUCATION | University of Maryland, College Park | |
| | PhD. in Computer Science M.S. in Computer Science | September 2014 - July 2019 December 2016 |
| | Indian Institute of Technology, Madras | August 2010 - July 2014 |
| | B.Tech Honours in Computer Science and Engineering Minor: Operations Research | |
| AWARDS | <ul style="list-style-type: none"> • <i>Top-5 most downloaded papers from TEAC '21 & '22</i> • <i>Best/Top/Outstanding reviewer</i>, NeurIPS 2019, ICML 2020, NeurIPS 2021 • <i>Future Faculty Fellow</i>, University of Maryland, 2018 • <i>Dean's Fellowship</i>, University of Maryland, 2014, 2015 • <i>S.N. Bose Scholarship</i>, India, 2013 • <i>National Talent Search (NTSE) Scholarship</i>, India, 2010 | |
| RECENT WORK AND RESEARCH EXPERIENCE | Facebook/Meta, Menlo Park, USA | September 2019 - |
| | <i>Member of Technical Staff in GenAI developing LLama-based LLMs Support teams to develop new algorithms and systems based on machine learning (particularly RL, LLMs, bandits, active learning) across many problem teams (ads, hostile speech, vaccine misinfo, recommender systems, ML dev tools, Generative AI) within the company.</i> | |
| | Microsoft Research New York City, USA | June - September 2018 |
| | <i>Supported by Nicole Immorlica, Rob Schapire, Alex Slivkins</i> | |
| | Indian Institute of Science & Microsoft Research, Bengaluru, India | May - July 2017 |
| | <i>Supported by Anand Louis, Navin Goyal</i> | |
| | IBM Almaden Research Center, San Jose, USA | May - August 2016 |
| | Adobe Inc., San Jose, USA | May - August 2015 |
| | Research Assistant at UMD, College Park, USA | August 2014 - July 2019 |
| | Instructor, University of Maryland | January - May 2019 |
| TEACHING EXPERIENCE | <i>CMSC250H - Discrete Structures (Honors) along with Prof. Bill Gasarch Responsibilities: Designing the syllabus, homework, exams and grading policy. Weekly lecturing.</i> | |
| | Teaching Assistant, University of Maryland | August 2014 - December 2018 |
| | <i>CMSC250 - Discrete Structures (2 sems.), CMSC131- Intro to Programming (2 sems.), CMSC451/651- Advanced Algorithms (5 sems.) Responsibilities: Guest Lectures, Conducting Discussion Sessions, Office Hours, Grading</i> | |
| | Teaching Assistant, Indian Institute of Technology, Madras | January - April 2014 |
| | <i>Paradigms of Programming Responsibilities: Grading Programming Assignments</i> | |
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| PROGRAMMING | C++, Python, SQL/Presto/Hive, PyTorch | |

1. “Promoting External and Internal Equities Under Ex-Ante/Ex-Post Metrics in Online Resource Allocation” — Joint work with Pan Xu, Aravind Srinivasan
- (C) *The 41st International Conference on Machine Learning (ICML 2024)* [Spotlight - top 3.5% of accepted papers]
2. “Effective Long-Context Scaling of Foundation Models” — Joint work with 21 authors
- (C) *Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL), 2024*
3. “Rethinking Incentives in Recommender Systems: Are Monotone Rewards Always Beneficial?” — Joint work with Fan Yao, Chuanhao Li, Yiming Liao, Yan Zhu, Qifan Wang, Hongning Wang, Haifeng Xu
- (C) *The 37th Conference on Neural Information Processing Systems (NeurIPS), 2023*
4. “Contextual Bandits with Packing and Covering Constraints: A Modular Lagrangian Approach via Regression” — Joint work with Alex Slivkins, Dylan Foster, Xingyu Zhou
- (C) *The 36th Annual Conference on Learning Theory (COLT), 2023*
- (J) *Journal of Machine Learning Research (JMLR), 2024 (IF: 4.091)*
5. “Allocation Problem in Remote Teleoperation: Online Matching with Offline Reusable Resources and Delayed Assignments” — Joint work with Osnat Ackerman Viden, Yohai Trabelsi, Pan Xu, Oleg Maksimov and Sarit Kraus
- (C) *The 22nd International Conference on Autonomous Agents and Multiagent Systems (AA-MAS), 2023*
6. “Robust Identifiability in Linear Structural Equation Models for Causal Inference” — Joint work with Navin Goyal, Anand Louis
- (C) *The 38th Conference on Uncertainty in Artificial Intelligence (UAI), 2022*
- *NeurIPS Workshop on Safety and Robustness in Decision Making, 2019*
7. “Online minimum matching with uniform metric and random arrivals” — Joint work with Sharmila Duppala and Pan Xu
- (J) *Operations Research Letters, 2022 (IF: 0.76)*
8. “Bandits with Knapsacks beyond the Worst-Case” — Joint work with Alex Slivkins
- (C) *The 35th Conference on Neural Information Processing (NeurIPS), 2021*
9. “Beyond $\log^2(T)$ Regret for Decentralized Bandits in Matching Markets” — Joint work with Soumya Basu, Abishek Sankararaman
- (C) *The 38th International Conference on Machine Learning (ICML), 2021*
10. “Multi-armed Bandits with Cost Subsidy” — Joint work with Deeksha Sinha, Abbas Kazerouni and Vashist Avadhanula
- (C) *The 24th International Conference on Artificial Intelligence and Statistics (AISTats), 2021*
11. “Dominate or Delete: Decentralized Competing Bandits with Uniform Valuation” — Joint work with Abishek Sankararaman and Soumya Basu
- (C) *The 24th International Conference on Artificial Intelligence and Statistics (AISTats), 2021*
12. “Stochastic bandits for multi-platform budget optimization in online advertising” — Joint work with Vashist Avadhanula, Riccardo Colini-Baldeschi, Stefano Leonardi and Okke Schrijvers
- (C) *The 30th Web Conference 2021 (formerly known as WWW)*
13. “Analyzing the effect of neural network architecture on training performance” — Joint work with Soham De*, Zheng Xu, Ronny Huang, Tom Goldstein
- (C) *The 37th International Conference on Machine Learning (ICML), 2020*
- *NeurIPS Workshop on Integration of Deep Learning Theory, 2018*
14. “Matching Algorithms for Blood Donation” — Joint work with Duncan McElfresh, Sergey Pupyrev, Christian Kroer, John Dickerson, Eric Sodomka, Zack Chauvin and Neil Dexter
- (C) *The 21st ACM Conference on Economics and Computation (EC) 2020*
- (J) *Nature Machine Intelligence, 2023 (IF: 25.9)*
15. “Balancing the Tradeoff between Profit and Fairness in Rideshare Platforms during High-Demand Hours” — Joint work with Vedant Nanda, John Dickerson, Aravind Srinivasan, Pan Xu
- (C) *The 34th AAAI Conference on Artificial Intelligence (AAAI), 2020*
- (C) *Extended Abstract in the Third AAAI/ACM Conference on AI, Ethics and Society (AIES), 2020 (Oral Presentation)*
16. “Mix and Match: Markov Chains and Mixing Times for Matching in Rideshare” — Joint work with Mike Curry, John Dickerson, Aravind Srinivasan, Yuhao Wan, Pan Xu
- (C) *The 15th Conference on Web and Internet Economics (WINE), 2019*

17. “[Adversarial Bandits with Knapsacks](#)” — Joint work with Nicole Immorlica, Robert Schapire, Alex Slivkins
 - (C) *The 60th IEEE Symposium on Foundations of Computer Science (FOCS)*, 2019
 - *INFORMS workshop on Market Design (with EC 2019)*
 - (J) *Journal of the ACM (JACM)*, 2022 (IF: 2.35)
18. “[Stability of Linear Structural Equation Model of Causal Inference](#)” — Joint work with Navin Goyal, Anand Louis
 - (C) *The 35th Conference on Uncertainty in Artificial Intelligence (UAI)*, 2019
 - *NeurIPS Workshop on Causality*, 2018
19. “[Online Resource Allocation with Matching Constraints](#)” — Joint work with John Dickerson, Kanthi Sarpatwar, Aravind Srinivasan, Kun-Lung Wu, Pan Xu
 - (C) *The 18th Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2019
20. “[A Unified Approach to Online Matching with Conflict-Aware Constraints](#)” — Joint work with Hao Cheng, John Dickerson, Yexuan Shi, Aravind Srinivasan, Yongxin Tong, Leonidas Tsepenekas, Pan Xu
 - (C) *The 33rd AAAI Conference on Artificial Intelligence (AAAI)*, 2019
21. “[Balancing Relevance and Diversity in Online Matching via Submodularity](#)” — Joint work with John Dickerson, Aravind Srinivasan, Pan Xu
 - (C) *The 33rd AAAI Conference on Artificial Intelligence (AAAI)*, 2019
22. “[Assigning Workers to Tasks in Crowdsourcing Platforms: Two-Sided Online Matching](#)” — Joint work with John Dickerson, Aravind Srinivasan, Pan Xu
 - (C) *The 17th Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2018
 - (J) *Full version in Transactions on Economics and Computation (TEAC)*, 2024 (IF: 4.32)
23. “[Combinatorial Semi-Bandits with Knapsacks](#)” — Joint work with Alexandrs Slivkins
 - (C) *The 21st International Conference on Artificial Intelligence and Statistics (AISTats)*, 2018
 - **(Invited for Oral Presentation)**
24. “[Allocation Problems in Ride-Sharing Platforms: Online Matching with Offline Reusable Resources](#)” — Joint work with John Dickerson, Aravind Srinivasan, Pan Xu
 - (C) *The 32th AAAI Conference on Artificial Intelligence (AAAI)*, 2018 — **(Invited for Oral Presentation)**
 - (J) *Full version in Transactions on Economics and Computation (TEAC)*, 2021 (IF: 4.32)
 - (Award): Top-5 most downloaded papers, among papers published in TEAC '21 & '22 and Top-20 most downloaded among all papers published in TEAC
25. “[Algorithms to Approximate Column-Sparse Packing Problems](#)” — Joint work with Brian Brubach, Aravind Srinivasan, Pan Xu
 - (C) *The 29th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2018
 - (J) *Full version in ACM Transactions of Algorithms (TALG)*, 2019 (IF: 0.4)
26. “[Attenuation-based Frameworks for Online Stochastic Matching with Timeouts](#)” — Joint work with Brian Brubach, Aravind Srinivasan, Pan Xu
 - (C) *The 16th Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2017
 - (J) *Full version in Algorithmica*, 2019 (IF: 0.49)
27. “[Improved Algorithms for Online Stochastic Matching](#)” — Joint work with Brian Brubach, Aravind Srinivasan, Pan Xu
 - (C) *The 24th Annual European Symposium on Algorithms (ESA)*, 2016
 - (J) *Full version in Algorithmica* 2020 (IF: 0.49)
28. “[Ensuring Privacy in Location-Based Services: An Approach Based on Opacity Enforcement](#)” — Joint work with Yi-Chin Wu, Stéphane Lafortune
 - (C) *The 14th International Workshop of Discrete Event Systems (WODES)*, 2014
29. “On the Equivalence of Graph Convolution and Mixup” — Joint work Xiaotian Han, Hanqing Zeng, Yu Chen, Shaoliang Nie, Jingzhou Liu, Kanika Narang, Zahra Shakeri, Song Jiang, Madian Khabsa, Qifan Wang, Xia Hu
 - (J) *Transactions of Machine Learning Research (TMLR)*, 2024

1. “[Multi-IF: Benchmarking LLMs on Multi-Turn and Multilingual Instructions Following](#)” — Joint work with Yun He, Di Jin, Chaoqi Wang, Chloe Bi, Karishma Mandyam, Hejia Zhang, Chen Zhu, Ning Li, Tengyu Xu, Hongjiang Lv, Shruti Bhosale, Chenguang Zhu, Eryk Helenowski, Melanie Kambadur, Aditya Tayade, Hao Ma, Han Fang, Sinong Wang - *Arxiv 2024*
2. “[Preference Optimization with Multi-Sample Comparisons](#)” — Joint work with Chaoqi Wang, Zhuokai Zhao, Chen Zhu, Michal Valko, Xuefei Cao, Zhaorun Chen, Madian Khabsa, Yuxin Chen, Hao Ma, Sinong Wang - *Arxiv 2024*
3. “[The Perfect Blend: Redefining RLHF with Mixture of Judges](#)” — Joint work with Tengyu Xu, Eryk Helenowski, Di Jin, Kaiyan Peng, Eric Han, Shaoliang Nie, Chen Zhu, Hejia Zhang, Wenxuan Zhou, Zhouhao Zeng, Yun He, Karishma Mandyam, Arya Talabzadeh, Madian Khabsa, Gabriel Cohen, Yuandong Tian, Hao Ma, Sinong Wang, Han Fang - *Arxiv 2024*
4. “[BayesFormer: Transformer with Uncertainty Estimation](#)” — Joint work with Sinong Wang and Han Fang - *Arxiv 2022*
5. “[Improved Adaptive Algorithm for Scalable Active Learning with Weak Labeler](#)” — Joint work with Yifang Chen, Alessandro Lazaric, Matteo Pirotta, Dmytro Karamshuk, Qifan Wang, Karishma Mandyam, Sinong Wang, Han Fang - *Arxiv 2022*
6. “[Improved Approximation Algorithms for Stochastic-Matching Problems](#)” — Joint work with Marek Adamczyk, Brian Brubach, Fabrizio Grandoni, Aravind Srinivasan and Pan Xu - *Arxiv 2021*

Senior Program Committee/Area Chair/Meta-reviewer. IJCAI '21 - '24, AAMAS '22, ACML '22 - '23, AAAI Safe and Robust AI Track '23

Conference (reviewer and program committee). EC, NeurIPS, ICLR, AISTats, ICML, UAI, SODA, AAAI, WWW, IJCAI, COLT, CIKM, STOC, AI for Social Impact @ AAAI, AI for social good @ NeurIPS, NeurIPS Reproducibility Challenge, Global Challenges in EC

Journal (reviewer). Transactions on Algorithms, Networks, Optimization Letters, JAAMAS, Mathematics of Operations Research, Operations Research, Transactions of Signal Processing, Discrete Optimization, Artificial Intelligence, Nature-Scientific Reports, IEEE Transactions on Neural Networks and Learning Systems, Journal of Machine Learning Research (JMLR), Journal of Artificial Intelligence (JAIR), Journal of the ACM (JACM), Neural Computation

Mentor in “New in ML” workshop: Mentoring new researchers on writing machine learning papers.

Session Chair AAMAS '22

Graduate Admissions Committee (UMD). CS department, UMD, 2016, 2017, 2018