

CONTACT	Webpage: http://karthikabinavs.xyz Email: karthikabinavs@gmail.com	
INTERESTS	Foundations and Applications of Artificial Intelligence: Robust Decision Making, Sequential Decision Problems (Online Matching, Multi-armed Bandits, SGD), Discrete and Continuous Optimization, Causality, Matching-based market design, Rideshare, Online Advertising.	
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"> • Best reviewer, NeurIPS 2019 • <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, Menlo Park, USA	September 2019 -
	<i>Machine Learning Research Scientist</i>	
	Microsoft Research New York City, USA	June - September 2018
	<i>Intern with Nicole Immorlica, Rob Schapire, Alex Slivkins</i>	
	Indian Institute of Science, Bengaluru, India	May - July 2017
	<i>Research visit with Anand Louis, Navin Goyal</i>	
	IBM Almaden Research Center, San Jose, USA	May - August 2016
	<i>Intern with Shivakumar Vaithyanathan, Prithviraj Sen</i>	
	Adobe Inc., San Jose, USA	May - August 2015
	<i>Intern with Anil Kamath</i>	
	Research/Teaching Assistant at UMD, College Park, USA	August 2014 - July 2019
	<i>Research Assistant with Aravind Srinivasan</i>	
TEACHING EXPERIENCE	Instructor, University of Maryland	July 2019
	<i>Online Lectures on Introduction to Mathematics of Online Learning</i>	
	<i>Responsibilities:</i> Several hours of video lectures on introduction to the theory of online learning.	
	Instructor, University of Maryland	January - May 2019
	<i>CMSC250H - Discrete Structures (Honors) along with Prof. Bill Gasarch</i>	
	<i>Responsibilities:</i> Designing the syllabus, homework, exams and grading policy. Weekly lecturing.	
	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.)</i>	
	<i>Responsibilities:</i> Guest Lectures, Conducting Discussion Sessions, Office Hours, Grading	
	Teaching Assistant, Indian Institute of Technology, Madras	January - April 2014
	<i>Paradigms of Programming</i>	
	<i>Responsibilities:</i> Grading Programming Assignments	

(α) indicates co-first author. (*) represents the other first author.

($\alpha\beta$) indicates (author) alphabetical ordering by last name.

1. “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
- *Extended Abstract in the Third AAAI/ACM Conference on AI, Ethics and Society (AIES)*, 2020 (**Oral Presentation**)
2. ($\alpha\beta$) “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
3. ($\alpha\beta$) “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) [Under review *Journal of the ACM (JACM)*]
4. (α) “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
5. ($\alpha\beta$) “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
6. “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
7. ($\alpha\beta$) “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
8. ($\alpha\beta$) “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) [Under review *Operations Research (OR)*]
9. ($\alpha\beta$) “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**)
10. ($\alpha\beta$) “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: *Major Revision Transactions on Economics and Computation (TEAC)*]
11. ($\alpha\beta$) “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
12. ($\alpha\beta$) “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
13. ($\alpha\beta$) “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: *Major revision in Algorithmica*]
14. “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

THESIS	<ol style="list-style-type: none"> 1. “Sequential Decision Making with Limited Resources” <i>PhD Thesis, University of Maryland College Park, 2019</i>
WORKSHOP PAPERS/ MANUSCRIPTS	<ol style="list-style-type: none"> 1. (α) “The Impact of Neural Network Overparameterization on Gradient Confusion and Stochastic Gradient Descent” — Joint work with Soham De*, Zheng Xu, Ronny Huang, Tom Goldstein - <i>NeurIPS Workshop on Integration of Deep Learning Theory, 2018</i> 2. (α) “Robust Identifiability in Linear Structural Equation Models for Causal Inference” — Joint work with Navin Goyal, Anand Louis - <i>NeurIPS Workshop on Safety and Robustness in Decision Making, 2019</i> 3. ($\alpha\beta$) “Advances in Bandits with Knapsacks” — Joint work with Alex Slivkins - <i>[Manuscript 2020]</i>
VOLUNTARY SERVICE	<p>Conference (reviewer and program committee). EC ('18), NeurIPS ('18, '19), ICLR ('19, '20), AISTats ('19, '20), ICML ('19, '20), UAI ('19, '20), SODA ('20), AAAI ('20), WWW ('20), IJCAI ('20), COLT ('20), AI for Social Impact @ AAAI-20, AI for social good @ NeurIPS-19, NeurIPS-19 Reproducibility Challenge</p> <p>Journal (reviewer). Transactions on Algorithms, Networks, Optimization Letters, JAAMAS, Mathematics of Operations Research, Operations Research, Transactions of Signal Processing</p> <p>Mentor in “New in ML” workshop: Mentoring new researchers on writing machine learning papers.</p> <p>Membership. ACM SIGACT</p> <p>Graduate Admissions Committee (UMD). CS department, UMD, 2016, 2017, 2018</p> <p>Graduate Executive Council (UMD). Secretary 2017</p> <p>Capital Area Theory Seminar Organizer. 2016, 2017, 2018</p>
GRANTS	FOCS 2016 Travel Award, UMD CS Travel Award (2017), SODA 2018 Travel Award, Goldhaber Travel Award (2018), ICSSA Travel Award (2018), AISTats 2018 Travel Grant, AAMAS 2019 Student Scholarship
SELECTED TALKS	<ol style="list-style-type: none"> 1. Online Matching Problems <ul style="list-style-type: none"> - IBM Almaden Center, Theory Group - IBM Almaden Center, Machine Learning Group 2. Algorithms to Approximate Column-Sparse Packing Problems <ul style="list-style-type: none"> - Symposium on Discrete Algorithms (SODA), 2018, New Orleans - Indian Institute of Technology, Madras 3. Combinatorial Semi-Bandits with Knapsacks <ul style="list-style-type: none"> - International Conference on Artificial Intelligence and Statistics (AISTATS), 2018 - Indian Institute of Science, Bengaluru - Indian Institute of Technology, Madras 4. Adversarial Bandits with Knapsacks <ul style="list-style-type: none"> - Johns Hopkins Theory Seminar - Google Research, NYC - Indian Institute of Science, Bengaluru - INFORMS Workshop on Market Design, 2019 - Foundations of Computer Science (FOCS), 2019, Baltimore
PROGRAMMING	C++, Python, Java
REFERENCES	References available on request.