

Karthik Abinav Sankararaman

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Department of Computer Science
University of Maryland, College Park

CONTACT INFORMATION

Phone: (+1) 240-715-5910 **Address:** A.V. Williams Building, UMD,
College Park, MD - 20742
Webpage: karthikabinavs.xyz **Email:** kabinav@cs.umd.edu

INTERESTS

Algorithms, Machine Learning, Artificial Intelligence, Operations Research

EDUCATION

University of Maryland, College Park

PhD. in Computer Science

September 2014 - August 2019 (Expected)

M.S. in Computer Science

December 2016

Advisor: Dr. Aravind Srinivasan

Indian Institute of Technology, Madras

August 2010 - July 2014

B.Tech Honours in Computer Science and Engineering

GPA: 9.01/10

Minor: Operations Research

Thesis: Maximum Flow Problem in Undirected Graphs

Advisor: Dr. N.S. Narayanaswamy

HONORS

- Selected for the *Future Faculty Fellow* program, UMD, 2018
- Nominated by the UMD CS department for IBM PhD fellowship, 2017
- **Dean's Fellowship:** University of Maryland, 2014, 2015
- Recipient of the *S.N. Bose Scholarship* 2013 given to **top 50** Indian students.
- Awardee of the *National Talent Search Examination(NTSE)* Scholarship.
- 14th and 16th position in ICPC Mid-Atlantic regionals 2014 and ICPC Asia-Amritapuri regionals 2013 respectively.

SELECTED PUBLICATIONS

(As per
tradition, author
names are
ordered
alphabetically by
last name)

1. "Matching Workers to Tasks in Crowdsourcing Platforms: Two-Sided Online Matching" — Joint work with John Dickerson, Aravind Srinivasan, Pan Xu
The 17th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2018
2. "[Combinatorial Semi-Bandits with Knapsacks](#)" — Joint work with Alexandrs Slivkins
The 21st International Conference on Artificial Intelligence and Statistics (AISTATS), 2018 — *(Invited for Oral Presentation)*
3. "[Allocation Problems in Ride-Sharing Platforms: Online Matching with Offline Reusable Resources](#)" — Joint work with John Dickerson, Aravind Srinivasan, Pan Xu
The 32th AAAI Conference on Artificial Intelligence (AAAI), 2018 — *(Invited for Oral Presentation)*
4. "[Algorithms to Approximate Column-Sparse Packing Problems](#)" — Joint work with Brian Brubach, Aravind Srinivasan, Pan Xu
The 29th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), 2018
5. "[Attenuation-based Frameworks for Online Stochastic Matching with Timeouts](#)" — Joint work with Brian Brubach, Aravind Srinivasan, Pan Xu
The 16th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2017
6. "[New Algorithms, Better Bounds, and a Novel Model for Online Stochastic Matching](#)" — Joint work with Brian Brubach, Aravind Srinivasan, Pan Xu
The 24th Annual European Symposium on Algorithms (ESA), 2016
7. "Ensuring Privacy in Location-Based Services: An Approach Based on Opacity Enforcement" — Joint work with Yi-Chin Wu, Stéphane Lafortune
The 14th International Workshop of Discrete Event Systems (WODES), 2014

MANUSCRIPTS

1. “Online Multi-Budgeted Assignment in Matching Markets with Historical Data” — Joint work with Kanthi Sarpatwar, Aravind Srinivasan, Kun-Lung Wu, Pan Xu
Under Review IJCAI 2018
2. “Online Submodular Bipartite Matching” — Joint work with John Dickerson, Aravind Srinivasan, Pan Xu
Under Review ICML 2018
3. “[Online Stochastic Matching: New Algorithms and Bounds](#)” — Joint work with Brian Brubach, Aravind Srinivasan, Pan Xu
Under review Mathematics of Operations Research — Short version previously appeared at ESA-2016

RESEARCH
EXPERIENCE**Causal Inference****May 2017 - Present**

Part of this project conducted as a visitor to Indian Institute of Science and Microsoft Research, Bangalore during May-July 2017

Joint work with Navin Goyal, Anand Louis

Working on algorithmic problems in theory of causal inference.

Bandit Algorithms and Online Learning**August 2016 - Present**

University of Maryland, College Park

Joint work with Alex Slivkins

Working on Bandit algorithms with global budget constraints.

Stochastic Optimization, Economics and Algorithms, Discrete Optimization in Machine Learning**August 2014 - Present**

University of Maryland, College Park

Joint works on multiple projects with Brian Brubach, John Dickerson, Aravind Srinivasan, Pan Xu

Working on multiple problems such as crowdsourcing algorithms, budgeted allocation and matching problems, sub-modular optimization.

Algorithms for Maximum Flow, Graph Sparsification and related problems**Aug 2013 - Aug 2014**

Indian Institute of Technology, Madras

Area of Work: Spectral Graph Theory, Convex Optimization

Joint work with Narayanaswamy N.S.

Privacy in Location Based Services**May - July 2013**

University of Michigan, Ann Arbor

Area of Work: Cyber Security

Joint work with Yi-Chin Wu, Stéphane Lafortune

TEACHING
EXPERIENCE**Teaching Assistant, University of Maryland**

CMSC250 - Discrete Structures (2 sems.), CMSC131- Intro to Programming (2 sems.), CMSC451/651- Advanced Algorithms (4 sems.)

Responsibilities: Guest Lectures, Conducting Discussion Sessions, Office Hours, Grading

Teaching Assistant, Indian Institute of Technology, Madras

Paradigms of Programming

Responsibilities: Grading Programming Assignments

PROFESSIONAL
EXPERIENCE**IBM Almaden Research Center, San Jose, CA****Summer 2016**

Manager: Shivakumar Vaithyanathan, Mentor: Prithviraj Sen

Inter-disciplinary project on Algorithms, Machine Learning and Finance

Technical Report—*Karthik Abinav Sankararaman, Prithviraj Sen, Marina Danilevsky, Sanjiv R Das, Seoyoung Kim, Rajasekhar Krishnamurthy, Shivakumar Vaithyanathan “Financial Time-Series Nowcasting with LSTM’s and Imperfect Information”*

Adobe Inc., San Jose, CA**Summer 2015**

Algorithms Team headed by Anil Kamath; Mentor: Fangpo Wang

Database algorithms

MISCELLANEOUS **External Reviewer:** Transactions on Algorithms (TALG), Networks, Autonomous Agents and Multi-agent System (AGNT)
Graduate Admissions Committee: Department of Computer Science, UMD, 2016, 2017, 2018
Graduate Executive Council: Secretary 2017
CATS organizer: 2016-2017
Grants: FOCS 2016 Travel Award, UMD CS Travel Award (2017), SODA 2018 Travel Award, Goldhaber Travel Award (2018), ICSSA Travel Award (2018)

COLLABORATORS Brian Brubach (UMD), Yi-Chin Wu (UMich), John Dickerson (UMD), Navin Goyal (Microsoft Research), Stéphane Lafortune (UMich), Anand Louis (IISc), Kanthi K. Sarpatwar (IBM Research), Prithviraj Sen (IBM Research), Aleksandrs Slivkins (Microsoft Research), Aravind Srinivasan (UMD), Kun-Lung Wu (IBM Research), Pan Xu (UMD)