# Karthik Abinav Sankararaman

Department of Computer Science
University of Maryland, College Park

December 2017

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**CONTACT INFORMATION**

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**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

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

1. "Allocation Problems in Ride-Sharing Platforms: Online Matching with Offline Reusable Resources" — Joint work with John Dickerson, Aravind Srinivasan, Pan Xu
*Proceedings of the 32th AAAI Conference on Artificial Intelligence (AAAI), 2018*

2. "Algorithms to Approximate Column-Sparse Packing Problems" — Joint work with Brian Brubach, Aravind Srinivasan, Pan Xu
*Proceedings of the 29th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), 2018*

3. "Attenuation-based Frameworks for Online Stochastic Matching with Timeouts" — Joint work with Brian Brubach, Aravind Srinivasan, Pan Xu
*Proceedings of the 16th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2017*

4. "New Algorithms, Better Bounds, and a Novel Model for Online Stochastic Matching"— Joint work with Brian Brubach, Aravind Srinivasan, Pan Xu
*Proceedings of the 24th Annual European Symposium on Algorithms (ESA), 2016*
*Full Version under submission to Mathematics of Operations Research*

5. "Ensuring Privacy in Location-Based Services: An Approach Based on Opacity Enforcement" — Joint work with Yi-Chin Wu, Stèphane Lafortune
*Proc. of the 14th International Workshop of Discrete Event Systems (WODES), 2014*

**MANUSCRIPTS**

1. "Combinatorial Semi-Bandits with Knapsacks" — Joint work with Alexandrs Slivkins
*Under review AISTATS-2018*

2. "Budgeted Online Assignment in Crowdsourcing Markets: Theory and Practice" — Joint work with Kanthi K. Sarpatwar, Aravind Srinivasan, Kun-Lung Wu, Pan Xu
*Under review WWW-2018*

3. "Matching Workers to Tasks in Crowdsourcing Platforms: Two-Sided Online Matching" — Joint work with John Dickerson, Aravind Srinivasan, Pan Xu
*Under review AAMAS-2018*

**HONORS**

- Selected for the *Future Faculty Fellow* program, UMD, 2017
- 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.

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| 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**            **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.

**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, Stèphane Lafortune*

**Teaching Experience**

**Teaching Assistant, University of Maryland**
*CMSC250 - Discrete Structures, CMSC131- Intro to Programming, CMSC451- Design and Analysis of Computer Algorithms*
*Responsibilities*: Conducting Discussion Sessions, Office Hours, Grading Homeworks and Exams

**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*

**Paper**—*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"', *Under Review SDM-2018*

**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
**Graduate Admissions Comittee:**   Department of Computer Science, UMD, 2016, 2017
**Graduate Executive Council:** Secretary 2017
**CATS organizer:** 2016-2017
**Grants:**   FOCS 2016 Travel Award, UMD CS Travel Award (2017), SODA 2018 Travel Award

Collaborators  Brian Brubach (UMD), Yi-Chin Wu (UMich), John Dickerson (UMD), Navin Goyal (Microsoft Research), Stèphane 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)