

# MARINA KNITTEL

(650) · 575 · 7145 ◊ mknittel@cs.umd.edu

Iribe 5104, 8125 Paint Branch Dr, College Park, MD, 20740

Website: mknittel.github.io

## RESEARCH INTERESTS

---

I study graph algorithms for big data. My current projects focus on distributed models for hierarchical clustering and classical graph problems. I am also working on creating new formulations of the stable marriage problem to model the faculty hiring market.

## EDUCATION

---

### University of Maryland, College Park

*PhD in Computer Science, 3.94 GPA*

College Park, MD

*Expected: May 2023*

**Advisor:** Prof. MohammadTaghi Hajiaghayi

**Coursework:** Approximation Algorithms, Modern Discrete Probability, Algorithms in Machine Learning, Algorithmic Lower Bounds, Computational Linguistics, Quantum Information Theory, Computational Genomics

### Harvey Mudd College

*B.S. in Computer Science and Mathematics, 3.75 GPA*

Claremont, CA

*May 2018*

**Advanced Coursework:** Advanced Algorithms, Computational Complexity, Graph Theory, Convex Set Theory, Machine Learning, Artificial Intelligence, Logic, Advanced Linear Algebra

## HONORS AND AWARDS

---

University of Maryland	Dean's Fellow	2018-2020
Harvey Mudd College	Class of '94 Award	2018
	High Distinction	2018
	Honors in Computer Science	2018
	Honors in Mathematics	2018
	Dean's List	2015-2018
Palo Alto High School	Sandra Forsythe Memorial Scholarship	2014

## PUBLICATIONS

---

### Conference:

1. (*Submitted*) Sara Ahmadian, Alessandro Epasto, Marina Knittel, Ravi Kumar, Mohammad Mahdian, and Philip Pham. "Fair Hierarchical Clustering".
2. (*Submitted*) MohammadTaghi Hajiaghayi and Marina Knittel, "Matching Affinity Clustering: Improved Hierarchical Clustering at Scale with Guarantees".
3. Soheil Behnezhad, Mahsa Derakhshan, MohammadTaghi Hajiaghayi, Marina Knittel, and Hamed Saleh, "Streaming and Massively Parallel Algorithms for Edge Coloring". The 27th Annual European Symposium on Algorithms (ESA), 2019.
4. Jordan R. Abrahams, David A. Chu, Grace Diehl, Marina Knittel, Judy Lin, William Lloyd, James C. Boerkoel Jr., and Jeremy Frank, "DREAM: An Algorithm for Mitigating the Overhead of Robust Rescheduling". The 29th International Conference on Automated Planning and Scheduling (ICAPS), 2019.

5. Hoaxing Du, Yi Sheng Ong, Marina Knittel, Ross Mawhorter, Ivy Liu, Gianluca Gross, Reiko Tojo, Ran Libeskind-Hadas, and Yi-Chieh Wu, “Multiple Optimal Reconciliations with Gene Duplication, Loss, and Coalescence”. The 17th Asia Pacific Bioinformatics Conference (APBC), 2019.

### Workshop and Brief Announcements:

6. Sara Ahmadian, Alessandro Epasto, Marina Knittel, Ravi Kumar, Mohammad Mahdian, and Philip Pham. “Fair Hierarchical Clustering”. The Sets & Partitions Workshop at the 33rd Conference on Neural Information Processing Systems (NeurIPS), 2019.
7. Soheil Behnezhad, Mahsa Derakhshan, MohammadTaghi Hajiaghayi, Marina Knittel, and Hamed Saleh, “Edge Coloring: MPC and Streaming Algorithms”. The 33rd International Symposium on Distributed Computing (DISC), 2019.
8. David A. Chu, Grace Diehl, Marina Knittel, Liam Lloyd, James C. Boerkoel Jr., and Jeremy Frank, “Trade-offs Between Communication, Rescheduling, and Success Rate in Uncertain Multi-Agent Schedules”. The Integrated Planning, Acting and Execution Workshop (IntEx) at The 28th International Conference on Automated Planning and Scheduling (ICAPS), 32-40, 2018.

## ACADEMIC EXPERIENCE

---

### NASA Ames & Harvey Mudd College

August 2017 - June 2018

*Senior Capstone Project Manager and Member*

*Claremont, CA*

- Led a team of 5 in a research-based project in scheduling algorithms
- Researched new methods for optimizing multi-agent system rescheduling with limited communication
- Theoretically and experimentally verified effect of communication on success

### Harvey Mudd College

August 2016 - May 2018

*Researcher in Computational Biology*

*Claremont, CA*

- Developed a new algorithm for fast and effective reconciliation for non-binary phylogenetic trees
- Proved various mathematical properties of a data structure used in phylogenetic reconciliation research
- Analyzed effectiveness of the binary phylogenetic tree reconciliation algorithm

### Rutgers University

May 2017 - August 2017

*Researcher in Theoretical Computer Science*

*Piscataway, New Jersey*

- Summer 2017 NSF-funded REU position under Professor Eric Allender at DIMACS
- Studied the Minimum Circuit Size Problem, Kolmogorov Random Strings and the Polynomial Hierarchy
- Modified the Turing machine to produce a hierarchy almost isomorphic to the Polynomial Hierarchy

### Harvey Mudd College

June 2015 - May 2016

*Researcher in Web Development*

*Claremont, California*

- Improved a research websites appeal and functionality (HTML, CSS, Javascript, PHP and Drupal)
- Trained new researchers in web development and coding practices to join the web development team

## WORK EXPERIENCE

---

### Google LLC

May 2019 - August 2019

*Software Engineering Intern*

*Seattle, WA*

- Developed and bounding efficient algorithms for hierarchical clustering without over-representation

- Migrated and improved open sourced tools for graph regularization using Keras (TensorFlow)
- Got a workshop paper at NeurIPS and submitted a conference paper to AISTATS

### **Facebook, Inc.**

*Software Engineering Intern*

May 2018 - August 2018

*Menlo Park, CA*

- Developed, trained, and tuned new neural network models for suggesting Instagram accounts to follow
- Incorporated handling for sparsed, crossed, and bucketized features in the training pipeline

### **Bloomberg LP**

*Software Engineering Intern*

May 2016 - July 2016

*New York City, NY*

- Built a service to assume a front end process and lighten client machine processing load
- Gained a deeper understanding of computer systems, C++, and elegant and adaptable coding practices

### **Napses**

*Web Development Intern*

May 2014 - August 2014

*Santa Barbara, CA*

- Programmed a blog in JavaScript (jQuery), HTML, and CSS, using Bootstrap for a start-up

## **TEACHING EXPERIENCE**

---

### **Teaching Assistant**

*University of Maryland, College Park*

September 2018 - Now

*College Park, MD*

- Courses: Discrete Structures, Cryptography
- Responsibilities: Lead recitations, hold tutoring hours, grade tests

### **Grader and Tutor**

*Harvey Mudd College*

January 2015 - May 2018

*Claremont, CA*

- Courses: Algorithms, Computational Complexity, Machine Learning, Data Structures & Program Development, Introductory Computer Science, Multivariable Calculus
- Responsibilities: Hold tutoring hours, grade homeworks

### **Homework Hotline Tutor**

*Harvey Mudd College*

September 2014 - December 2016

*Claremont, CA*

- Courses: topics in K-12 education
- Responsibilities: provide free over-the-phone tutoring for K-12 students

## **SERVICE AND LEADERSHIP**

---

### **External**

**University of Maryland**

Algorithmica Reviewer

2019 - Now

CATS Theory Lecture Organizer

2019 - Now

Executive Committee Member

2018 - Now

CS Women Mentor

2018 - Now

### **Harvey Mudd College**

Committee for Activities Planning Member

2017 - 2018

LGBT+ Club Mentor

2017 - 2018

Women in Math Club President

2017 - 2018

Dorm President

2016 - 2017

Dorm Treasurer

2015 - 2016