

MARINA KNITTEL

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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 approximation algorithms for planar versions of NP-hard problems and variants of the stable marriage problem.

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, Quantum Information Theory, Algorithms in Machine Learning, Algorithmic Lower Bounds, 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

Submitted:

1. Marina Knittel, MohammadTaghi Hajiaghayi, "Matching Affinity Clustering: Improved Hierarchical Clustering at Scale with Guarantees". The 33rd Annual Conference on Neural Information Processing System (NeurIPS), 2019.

Conference:

1. Soheil Behnezhad, Mahsa Derakhshan, MohammadTaghi Hajiaghayi, Marina Knittel, Hamed Saleh, "Streaming and Massively Parallel Algorithms for Edge Coloring". The 27th Annual European Symposium on Algorithms (ESA), 2019.
2. 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.

3. 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:

1. 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.

RESEARCH 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

- Developing and bounding efficient algorithms for hierarchical clustering without over-representation
- Exploring theoretically motivated graph regularization techniques on neural networks
- Migrating and improving open sourced tools for graph regularization using Keras (TensorFlow)

Facebook, Inc.

May 2018 - August 2018

Software Engineering Intern

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
- 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	Algorithmica Reviewer	2019
University of Maryland	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