

Rohan Garg

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Citizenship: USA

Research Interests Algorithmic Game Theory, Parallel and Distributed Computing, Combinatorial Optimization, Computational Social Choice

Current Position **Purdue University** West Lafayette, IN
Graduate Student Aug 2020 – Present

Education **Purdue University** West Lafayette, IN
Ph.D. in Computer Science Aug 2020 – Present
Advisor: Alex Psomas

The University of Texas at Austin Austin, TX
B.S. in Electrical and Computer Engineering Aug 2016 – May 2020
Track: Software Engineering
GPA: 3.5

Honors and Scholarships Ross Fellow (Purdue): “Recognizes academic excellence.” 2020 – 2021
University Honors Fall (UT Austin) 2016

Publications **Fairly Dividing Goods in Parallel**
Rohan Garg, Alexandros Psomas.
([Working Paper](#))

Fast and Work-Optimal Parallel Algorithms for Predicate Detection
Rohan Garg.
[arXiv preprint, 2020](#)

Parallel Algorithms for Predicate Detection
Vijay K. Garg, Rohan Garg.
2019. *Proceedings of the 20th International Conference on Distributed Computing and Networking*. Association for Computing Machinery, New York, NY, USA.
[ICDCN, 2019](#)

Research Experience

Fair Division and Kings in Graphs

Mentor: Alexandros Psomas (Purdue)

May 2021 – Present

Studied the role of randomization in truthful and efficient fair division settings. Currently also studying generalized king vertices in graphs.

Approximate Max-Flow and Hierarchical Cut Decompositions

Mentor: Kent Quanrud (Purdue)

Aug 2020 – Jan 2021

Studied Max-Flow, Sparsest Cut, and Nearly Linear time algorithms for Hierarchical Cut Decompositions of Weighted Graphs.

Machine Learning for Testing Graph Properties

Mentor: Sarfraz Khurshid (UT Austin)

Aug 2019 – May 2020

Studied machine learning models for testing data structure invariants. Extended work to graph properties. Full report available on my webpage.

Parallel and Distributed Systems Lab

Mentor: Vijay K. Garg (UT Austin)

May 2017 – Jan 2019

Studied Parallel and Distributed Algorithms. Resulted in ICDCN publication.

Community Detection

Mentor: Joe Neeman (UT Austin)

Aug 2018 – Jan 2019

Studied Community Detection and Spectral Clustering on Random Graphs.

Teaching Experience

CS 381: Intro to the Analysis of Algorithms, (Purdue)

Fall 2021

Head Graduate Teaching Assistant

In charge of creating assignments, administering discussion sessions, and holding office hours. Covering topics including dynamic programming, network flow, and intractability.

EE 360C: Algorithms, (UT Austin)

Spring 2019, 2020

Teaching Assistant

Created assignments, tests and quizzes over topics including runtime analysis, intractability, and network flow. Administered discussion sessions and office hours. **Spring '19 rated 4.5/5. Spring '20 rated 4.8/5.**

Industry Experience

Amazon AWS

Seattle, WA

Software Development Engineering Intern

Summer 2019

Developed a serverless function that combined and modified data from DynamoDB Key-Store System for Commerce Platform. Worked with AWS S3, Lambda, and DynamoDB technologies.

Cox Automotive vAuto Inc.

Austin, TX

Software Engineering Intern

Summer 2018

Developed Python applications to perform keyword extraction and text-entity detection using AWS Comprehend NLP tool for Backend Services team. Wrote Automated Tests for the front-end of AuctionGenius Products using C#/.NET and the Selenium Testing Framework to aid the Automated Testing team.

Courses

Purdue University

West Lafayette, IN

Enrolled: Data Communication and Computer Networks.

Completed: Distributed Systems, Machine Learning and Algorithms Seminar, Advanced Topics in Algorithms, Algorithmic Economics, Sublinear Algorithms, Approximation Algorithms, Randomized Algorithms (Audit), Graduate Algorithms.

The University of Texas at Austin

Austin, TX

Graduate: Combinatorics and Graph Theory (Audit), Graduate Algorithms, Mobile Computing (Audit).

Undergraduate: Abstract Algebra, Software Design I & II, Algorithms, Probability, Linear Algebra, Number Theory, Data Science, Theory of Computation.

Talks and Tutorials

Parallel Algorithms for Predicate Detection

Purdue Theory Reading Group

Spring 2022

Approaching Utopia: Strong Truthfulness and Externality-Resistant Mechanisms

Purdue Theory Seminar

Fall 2021

Improved Bounds for Matching in Random Streams

Purdue Theory Seminar

Spring 2021

Pigeonhole Principle and Some Applications

Purdue Algorithms Reading Group

Fall 2020

Error Correcting Codes

Purdue Algorithms Reading Group

Fall 2020

Intro to Parallel and Distributed Computing

Purdue Algorithms Reading Group

Fall 2020

The Feedback Vertex Set Problem

Purdue Algorithms Reading Group

Summer 2020

Approximation Algorithms for Multiway Cut and k-Cut

Purdue Algorithms Reading Group

Summer 2020

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| | Network Flow | |
| | Purdue Algorithms Reading Group | Spring 2020 |
| | Undergraduate Research and Jobs in Academia/Industry | |
| | Women in Natural Sciences First-Year Interest Group | Spring 2020 |
| Skills | Programming <u>Proficient in:</u> Java, Python. <u>Frameworks/Tools:</u> AWS Comprehend NLP, Selenium Web Testing, LaTeX. <u>Industry Practices:</u> Agile Methodology, Git Version Control, JUnit/NUnit. <u>Software:</u> AutoDesk Inventor (CAD), MultiSim/LogiSim (Circuit Simulation), MS Office. | |
| | Languages | |
| | English (Fluent), Hindi (Advanced), Spanish (Limited) | |
| Service and Outreach | Purdue Theory Seminar Group | 2022 |
| | Serving as co-organizer in charge of scheduling and preparing talks. | |
| | Purdue Theory Reading Group | 2022 |
| | Serving as co-organizer in charge of scheduling and preparing talks. | |
| | Purdue CS Graduate Student Board | |
| | Faculty Search Committee Representative. | 2021-22 |
| | General Board Member. | 2022-23 |
| | Purdue Algorithms Reading Group | 2020 |
| | Served as co-organizer in charge of scheduling and preparing talks. | |
| | UT Austin - Code Orange | 2018-19 |
| | Taught elementary school students basic programming principles. | |
| | UT Austin - Student Engineers Educating Kids | 2018 |
| | Taught elementary school students basic engineering principles. | |
| Other Interests | Badminton, Tennis, Soccer, Contract Bridge, Chess, English Premier League (Manchester United F.C). | |
| Last Updated | September 2022 | |