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Education

August 2021 – Present **PhD**, *Department of Industrial & Enterprise Systems Engineering (ISE), University of Illinois at Urbana-Champaign (UIUC)*, IL, USA
Doing research on fair division algorithms. Advised by Prof. Jugal Garg [↗](#).
July 2019 – July 2021 **M.Tech. (Research)**, *Computer Science and Automation (CSA), Indian Institute of Science (IISc)*, Bangalore, GPA: 9.7 / 10.0
Did research on approximation algorithms for variants of bin packing and knapsack. Advised by Prof. Arindam Khan [↗](#).
Aug 2014 – June 2018 **B.E. (Hons) Computer Science**, *Birla Institute of Technology and Science (BITS)*, Pilani, India, GPA: 9.14 / 10.00

Research Interests

Algorithms, Fair division, Graph theory, Packing and scheduling

Publications

- Existence and computation of epistemic EFX allocations, with Jugal Garg, [arXiv:2206.01710](#) [↗](#)
- Geometry meets vectors: approximation algorithms for multidimensional packing [↗](#), with Arindam Khan and K.V.N. Sreenivas, in FSTTCS 2022.
- Tight approximation algorithms for geometric bin packing with skewed items [↗](#) [↗](#), with Arindam Khan, in APPROX 2021.
- Harmonic algorithms for packing d -dimensional cuboids into bins [↗](#) [↗](#), in FSTTCS 2021.
- An approximation algorithm for covering linear programs and its application to bin-packing, [arXiv:2011.11268](#) [↗](#)
- Mitigating DNS amplification attacks using a set of geographically distributed SDN routers [↗](#), with Vishal Gupta, in International Conference on Advances in Computing, Communications, and Informatics (ICACCI) 2018.

Achievements

- April 2023 **Received the Sharp Outstanding Graduate Student Award**
- August 2021 **Received the Samuel Brainin Engineering Fellowship**
- July 2022
- March 2018 **Graduate Aptitude Test in Engineering (GATE)**
Secured all-India rank 86 (out of approximately 100,000 candidates) in the ‘Computer Science and IT’ test.
- BITS-Pilani Merit Scholarship**
Scored GPA within top 2% in three semesters.
- ACM-ICPC** [↗](#)
- ACM-ICPC is an international annual multi-tiered programming contest for college students. Around 3000 teams (of 3 students each) participate in the Indian online qualifying round each year. Top few teams qualify for on-site regional contests in India.
- Dec 2017 Ranked 29 out of 250 teams in Amritapuri regional contest.
- Dec 2016 Ranked 66 out of 450 teams in Amritapuri regional contest.
- Dec 2016 Ranked 30 out of 70 teams in Kharagpur regional contest.
- Dec 2015 Ranked 88 out of 250 teams in Amritapuri regional contest.

Invited Talks

- 22 Dec 2022 **Existence and computation of epistemic EFX allocations** [↗](#)
Indian Institute of Science, Bangalore

Projects



- June 2022 – **Algorithms for Fair Division of Indivisible Items**
Present *Topics*: fair division.
Supervisor: Prof. Jugal Garg [↗](#), ISE, UIUC.
- Jan 2020 – **Approximation Algorithms for Geometric Packing Problems** [↗](#)
July 2021 *Topics*: approximation algorithms, bin packing.
Supervisor: Prof. Arindam Khan [↗](#), CSA, IISc Bangalore.
- Sept 2017 – **Mitigating DNS-related DoS attacks using SDN** [↗](#)
Dec 2017 *Topics*: computer networks, network security, SDN.
Supervisor: Prof. Vishal Gupta, BITS Pilani.
Devised a new mechanism for mitigating DNS Amplification attacks, which uses a set of geographically-distributed SDN routers. Presented this work at ICACCI [↗](#) in September 2018.

Professional Service

Subreviewer for STOC 2022, SAGT 2022.

Work Experience

- Spring 2023 **Teaching Assistant, IE 310: Deterministic models in optimization**, UIUC
- Fall 2022 **Teaching Assistant, IE 300: Analysis of Data**, UIUC

- Fall 2020 **Teaching Assistant**, *Design and Analysis of Algorithms*, IISc Bangalore
- Aug 2018 – **Software Engineer**, *media.net*, Bangalore, India
- July 2019 *Topics*: machine learning, large-scale systems.
media.net is an advertisement-technology company. I worked on improving their real-time bidder.
- Jan 2018 – **Intern** , *American Express*, Gurgaon, India
- June 2018 *Topics*: neural networks, machine learning, big data.
Trained a neural network to predict credit-card defaulting. The input format was unconventional, so a custom architecture was devised. Its performance was at par with the production model, which was tuned over many years.
- May 2017 – **Intern**, *Directi*, Mumbai, India
- July 2017 *Topics*: machine learning.
Made Directi's news article classification algorithm recognize more categories.
- May 2016 – **Google Summer of Code (GSoC) Student** , *Zulip*
- Aug 2016 *Topics*: software development.
Zulip is an open-source group chat application. 3 students were selected from over 100 applicants to work on Zulip as part of the GSoC program.
- Annotated python code ($\sim 50,000$ lines) for use with a static type-checker.
 - Migrated code to Python 3 by switching to newer dependencies, using automated code conversion, standardizing string types, and fixing bugs.

Selected Coursework

UIUC:

- (CS 598 TH1) Recent Advances in Theoretical CS: ongoing
- (CS 473) Algorithms: grade A+
- (IE 511) Integer Programming: grade A
- (IE 519) Combinatorial Optimization: grade A
- (IE 410) Advanced Stochastic Processes and Applications: grade A+
- (IE 411) Optimization of Large Systems: grade A+

IISc Bangalore:

- Approximation Algorithms: grade A+, rank 1
- Design and Analysis of Algorithms: grade A+, rank 1
- Computational Methods of Optimization: grade A+, rank 1
- Cryptography: grade A

Computer Skills

\LaTeX , Python, C/C++, Java, HTML, CSS, JavaScript, SQL, Bash.

Student Societies

BITS-ACM, BITS Pilani ACM Student Chapter

- Problem setter for 6 programming contests organized by BITS-ACM.
- Created backends for web applications used in online quizzing events.
- Conducted intra-BITS-ACM workshops on 'Competitive Programming' and 'Linux and CLI'.