# Eklavya Sharma

*Curriculum Vitae*


Email: eklavya2@illinois.edu
Personal website: https://sharmaeklavya2.github.io
sharmaeklavya2 sharmaeklavya2


## Education

August 2021 – Present **PhD**, *Department of Industrial & Enterprise Systems Engineering (ISE), University of Illinois at Urbana-Champaign (UIUC)*, IL, USA
Research on fair resource allocation. 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, Game theory, Packing and scheduling.**

## Publications

- Two-Player Matrix Games Repeated Until Collision, with Aniket Murhekar, in FSTTCS 2023, doi:10.4230/LIPIcs.FSTTCS.2023.18
- New fairness concepts for allocating indivisible items, with Ioannis Caragiannis, Jugal Garg, Nidhi Rathi, and Giovanna Varricchio, in IJCAI 2023, doi:10.24963/ijcai.2023/284.
- Simplification and improvement of MMS approximation, with Hannaneh Akrami, Jugal Garg, and Setareh Taki, in IJCAI 2023.
- 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 Algorithmica and 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 ICACCI 2018.

## Achievements

July 2023 **Dr. MNS Swamy Medal for Best MTech (Research) Thesis, IISc**

April 2023 **Sharp Outstanding Graduate Student Award, UIUC**

August 2021 – July 2022 **Samuel Brainin Engineering Fellowship, UIUC**

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

27 Oct 2023 **Fair allocation of indivisible items**
Capital Area Theory Seminar, University of Maryland, College Park

22 Dec 2022 **Existence and computation of epistemic EFX allocations**
Indian Institute of Science, Bangalore

## Professional Service

Program committee member for AAMAS 2024.

Subreviewer for STOC'22, SAGT'22, EC'23, IJCAI'23, ESA'23, EC'24.

## Work Experience

Spring 2024 **Teaching Assistant**, *IE 300: Analysis of Data*, UIUC

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 – July 2019 **Software Engineer**, *media.net*, Bangalore, India
*Topics*: machine learning, large-scale systems.
media.net is an advertisement-technology company. I worked on improving their machine-learning-based algorithm for bidding in real-time ad auctions.

Jan 2018 – June 2018 **Intern**, *American Express*, Gurgaon, India
*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 – July 2017 **Intern**, *Directi*, Mumbai, India
*Topics*: machine learning.
Made Directi's news article classification algorithm recognize more categories.

May 2016 – Aug 2016 **Google Summer of Code (GSoC) Student**, *Zulip*
*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 580) Algorithmic Game Theory: grade A
- (CS 598 TH1) Recent Advances in Theoretical CS: grade A+
- (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, HTML, CSS, JavaScript, C/C++, Java, 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'.