


AMATYA SHARMA

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Department Of Computer Science and Engineering

Indian Institute of Technology, Kharagpur

EDUCATION

Indian Institute of Technology (IIT), Kharagpur

5th Year Dual Degree (B.Tech + M.Tech)

Computer Science and Engineering Department

August 2017 - Present

GPA 9.58/10

Rank 5

WORK EXPERIENCE

Computer Science and Automation, IISc Bangalore

Summer Research Intern

May - July 2019

- Research Intern at Indian Institute of Science (IISc), Bangalore mentored by Dr. Arindam Khan.
- Designed PPTAS for 2-D Guillotine Knapsack (refer Research Experience Section).

Computer Science and Automation, IISc Bangalore

Winter Research Intern

December 2019

- Formalized paper on 2-D Guillotine Geometric Knapsack Problem.
- Improved the present best approximation factor and established algorithmic links to the general version.

RESEARCH PROJECTS

On Guillotine Separable Packings for the Two-dimensional Geometric Knapsack Problem

Accepted at SoCG'21 (37th International Symposium on Computational Geometry) May 2019 - March 2020

- Designed an Approximation Algorithm (PPTAS) for a of 2-Dimensional Guillotine Geometric Knapsack.
- Improved previous best approximation factor for both weighted and cardinality cases of the problem.
- Mentor: Dr. Arindam Khan (CSA, Indian Institute of Science (IISc), Bangalore).

On Parameterized Complexity of Liquid Democracy

July 2019 - December 2019

Published at CALDAM'21 (7th Annual International Conference on Algorithms and Discrete Applied Maths)

- Designed Parameterized Algorithms for Computational Social Choice Theory problem of Liquid Democracy.
- Provided results on para-NP-Hardness, FPT Algorithms and LP formulation w.r.t different parameters.
- Mentor: Dr. Palash Dey (Computer Science Department, IIT Kharagpur).

The Art Gallery Problem : A Survey

July 2020 - January 2021

- Studied NP-hardness, $\exists R - Completeness$ and bounds on AGT problem
- Studied numerous approximation and parameterized algorithms for AGT.
- Submitted to ACM-Computing Surveys Journal 2021.

Parameterized Complexity of Margin of Victory

Jan 2020 - Jun 2020

- Developed algorithms for Game Theoretic problem of computing Margin of Victory for tournament solutions.
- Designed parameterized algorithms with parameters including tree-width for the NP-Hard problem.
- Mentor: Dr. Palash Dey (Computer Science Department, IIT Kharagpur).

Gaussian Process Kernels, Term Project

July 2020 - December 2020

- Term Project in Advanced Machine Learning Course
- Studied local and global approximations of Gaussian kernels.
- Studied techniques for automations for kernel learning.

SOFTWARE PROJECTS

Shoten

Jan 2019 - July 2019

- Web Application serving as Online Book Store and Print Shop
- Implemented a website to serve as an e-book store and print request portal on institute level
- GitHub Repository Link: <https://github.com/aaysharma/Shoten>

TinyC Compiler

July 2019 - Nov 2019

- Compiler for language TinyC, a subset of C with a reduced subset of functionalities.
- Implemented parser and lexer with output as non-optimized machine level assembly language instructions.
- Code Bases and Languages employed: Yacc, BISON, FLEX, C, C++
- GitHub Repository Link: <https://github.com/aaysharma/TinyC-Compiler>

RISC Processor

July 2019 - Nov 2019

- Developed Reduced Instruction Set Computer Processor and simulated on FPGA Spartan 3 boards.
- Designed a single cycle executable processor using Verilog for a subset of MIPS instructions.
- GitHub Repository Link: <https://github.com/aaysharma/RISC-Fuggit>

SKILLS AND COURSE WORK

Algorithms	Approximation and Online Algorithms, Algorithmic Game Theory, Advanced Graph Theory, Parameterized and Randomized Algorithms.
Other Courses	Deep Learning, Advanced Machine Learning, Natural Language Processing,
Software & Tools	MySQL, LaTeX, Matlab, SolidWorks, HTML, CSS, PHP, JSP Java, Python, C++, C, BISON, Yacc, FLEX.
Other Relevant Courses	Linear Algebra, Discrete Mathematics, Algorithms, Operating Systems, Computer Networks, Software Engineering.
Languages	English, French, Hindi.

ACADEMIC ACHIEVEMENTS

Department Rank	Currently holding Department Rank 6 in the Computer Science Department.
Department Change'19	Changed Department to CS (first year) with rank among top 10 at IIT Kharagpur.
JEE Advanced'17	Attained an All India Rank of 1464 among 1.7 lakh students in JEE Advanced 2017.
SJVN Merit Scholar'17	Awardee of SJVN Merit Scholarship for performance in Senior Secondary Examination.
NTSE'15	Recipient of National Talent Search Examination (NTSE) Scholarship (State Rank 1).
RIMC'13	Secured National Rank in top 60, State Rank 1 in Rashtriya Indian Military College Exam.

EXTRA CURRICULAR

Co-Founder Annapurna, an initiative working against global poverty, hunger and wastage of food resources.