AMATYA SHARMA

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Department Of Computer Science and Engineering
Indian Institute of Technology, Kharagpur

EDUCATION

Indian Institute of Technology (IIT), Kharagpur *August 2017 - Present*
5^{th} Year Dual Degree (B.Tech + M.Tech) GPA 9.61/10
Computer Science and Engineering Department Rank 5

WORK EXPERIENCE

CSE, IIT Kharagpur | Teaching Assistant of Algorithmic Game Theory Course Aug 2021 - present

Computer Science Department, IIT Delhi | Summer Research Intern Apr 2021 - present

ExaCC, Oracle R&D | Summer Intern May - Jul 2021

Computer Science and Automation, IISc Bangalore | Winter Research Intern Dec 2019

Computer Science and Automation, IISc Bangalore | Summer Research Intern May - Jul 2019

PUBLICATIONS & RESEARCH

On Guillotine Separable Packings for the Two-dimensional Geometric Knapsack Problem
*Published at **SoCG'21** || Contributed Talk by me at **HALG'21*** *May 2019 - March 2020*
Coauthors: Arindam Khan (IISc), Arnab Maiti (IIT Kgp), Andreas Wiese (U of Chile)

- 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.

On Parameterized Complexity of Liquid Democracy *July 2019 - December 2019*
*Published at **CALDAM'21***
Coauthors: Palash Dey (IIT Kgp), Arnab Maiti (IIT Kgp)

- Devised Parameterized Algorithms for Computational Social Choice Theory problem of Liquid Democracy.
- Established results on para-NP-Hardness, FPT Algorithms and LP formulation w.r.t different parameters.

Weighted k-server problem *May 2021 - Present*
Mentor: Prof. Ashish Chiplunkar (IIT Delhi)

- Formulated online randomized algorithm for a variant of weighted k-server problem.
- Mitigated the gap between established upper bound and lower bound complexities.

The Art Gallery Problem : A Survey *July 2020 - January 2021*
*Submitted to **ACM Computing Surveys Journal***

- Studied NP-hardness, $\exists R - Completeness$ and bounds on AGT problem
- Analyzed numerous approximation and parameterized algorithms for AGT.

Parameterized Complexity of Margin of Victory *Jan 2020 - Jun 2020*
Mentor: Dr. Palash Dey (IIT Kharagpur)

- Formulated algorithms for Game Theoretic problem of computing Margin of Victory for tournament solutions.
- Contrived parameterized algorithms with parameters including tree-width for the NP-Hard problem.

Gaussian Process Kernels Survey *July 2020 - December 2020*

Term Project, Advanced Machine Learning Course, IIT Kharagpur

- Surveyed local and global approximations and examined automated learning techniques for Gaussian kernels

SOFTWARE PROJECTS

HTTP Authentication *May 2021 - July 2021*

- Implemented Java Library for secure HTTP Authentication using Java Cryptography Architecture.
- Summer intern Project at Oracle ExaCC team.

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 using 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

Theoretical CS	Approximation, Online, Parameterized and Randomized Algorithms, Algorithmic Game Theory, Advanced Graph Theory, Computational Geometry, Computational Complexity and Cryptography & Network Security.
Learning Theory	Reinforcement Learning, Deep Learning, Advanced Machine Learning, Natural Language Processing, Linear Algebra and Probability & Statistics.
Software & Tools	MySQL, Java Cryptography Architecture, Matlab, HTML, CSS, JSP, Python, C++, C, GIT.
Other Relevant Courses	Discrete Maths, Operating Systems, Computer Networks, Software Engineering.
Languages	English, French, Hindi.

ACADEMIC ACHIEVEMENTS

Department Rank	Currently holding Department Rank 5 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.