Kunwar Preet Singh

Senior Undergraduate
Computer Science & Engineering
Indian Institute of Technology, Kanpur

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Education

Qualification	Department/Board	Institute	Year	CPI/%
BTech	Computer Science & Engineering	IIT Kanpur	2020-24	**10.00**
Class XII	Central Board of Secondary Education	SGGS Chandigarh	2020	97.8%
Class X	Central Board of Secondary Education	CIS Chandigarh	2018	93.67%

Academic Achievements

- **Institute Rank 1** in the UG batch 2020 at IIT Kanpur
- Received **Academic Excellence Awards** (2022, 2021, 2020), for exceptional academic performances
- Received **A*** in **14** courses for exceptional performance
- Received **Prof. JN Kapur Prize** 2022, for being the top performer in undergraduate maths courses
- Received **Reliance Foundation Scholarship** 2021 in CS & AI, awarded to 40 UGs across India
- **Director's Scholarship**, given to the top first-year students
- All India Rank **58** (Chandigarh Topper) in JEE Mains 2020
- All India Rank **143** in JEE Advanced 2020
- All India Rank **74** in KVPY SA stream 2019
- Received **Merit Certificate** for exceptional performance at **INMO**, the selection exam in India for **IMO** 2019

Work Experience

Analysis of US Trade Signals — **Optiver, Amsterdam**
Quantitative Trading Intern — May 23 - June 23

- Studied theories about option pricing, did practical simulated trading in **EuroStoxx** and a research project about US Markets
- Worked on finding US trade signals which can distinguish good trades for MMs in the US & also help to **retreat** in other markets
- Experimented with various Machine learning approaches (**DTs, LSTM, XGBoost, NNs, Linear Models**) for checking if a reaction to a market trade is required and then pre-calculating future reaction thresholds to facilitate **quick AT/ AQ** response
- Created handcrafted decision strategy (inspired by **XGBoost**) for higher, robust and low latency performance

Privacy Risks in sharing GNNs — **NUS, Singapore**
Research Intern | Prof. Prateek Saxena — May 22 - July 22

- Studied Graph Neural Network Architectures like **GraphSAGE, DeepWalk, Node2Vec** used for learning over graphs
- Analyzed existing SOTA attacks like **LSAs** and **LinkTeller** which claim to be able to extract private data from GNNs
- Devised attacks that improve over the performance of these SOTA attacks and identified better metrics to measure success

Detecting Malicious Smart Contracts — **C3i, IIT Kanpur**
UG Researcher | Dr. Rachit Agarwal — Jan 22 - Apr 22

- Studied about vulnerabilities present in smart contracts
- Explored the correlations & causalities in the **transaction graph** to judge the probability of given SC being malicious

Technical Skills

Languages: C, C++, Python, Golang **Development**: Django, Docker, HTML, SQLite **Libs/ Utilities**: PyTorch, sklearn, numpy, pandas, seaborn, matplotlib, Networkx, Git, Bash, LaTeX

Projects

Java Compiler — *CS335*
Course Project • CS 335: Compiler Design — *Jan 23 - May 23*

- Implemented a compiler from scratch for a fully functional subset of the **Java 17** language to **x86_64** ISA
- Designed **lexer, parser and semantic analyzer**
- Supported all primitive data types and control flow statements
- Provided complete support for **OOPs**, arbitrary dimension arrays, static/non-static fields, array passing in functions
- Awarded with the **top score** in the course

Route Planning & Optimized Delivery — *GrowSimplee*
InterIIT Tech Meet 11.0 • Bronze Medal — *Jan 23 - Apr 23*

- Created an end-to-end application for solving **TSP** with constraints like bag capacity, fuel capacity and multiple drivers
- Devised an algorithm based on constrained **K-Means** clustering and heuristic-based dynamic programming to solve the problem

Exec: Election Commission App — *Exec*
Course Project • CS 253: Software Development — *Jan 22 - Apr 22*

- Developed a web application for conduction of elections at IITK
- Specifically worked towards designing a **cryptographically secure** protocol of anonymous and reliable reporting
- Implemented using **Springboot**, **ReactJS** and **MongoDB**

Pseudo Currency for IITK Campus — *iitk-coin*
Programming Club IIT Kanpur — *May 21 - Aug 21*

- Developed a back-end for a pseudo-currency using **GoLang**
- Explored deadlocks, races, atomicity and concurrency
- Employed **JWTs** for securing the APIs, deployed using **Docker**

Infosec101
Association for Computing Activities, IIT Kanpur — *May 21 - Aug 21*

- Learned about the basics of cryptography and techniques like SQL injections and CSRF attacks
- Explored topics like **secret sharing**, ring signatures, homomorphic encryptions and **verifiable computing**

Programming & Other Achievements

- Max rating of **1875** (Expert) on Codeforces **[kpS128]**
- **Rank 15** in Prelims, **48** in Amritapuri regionals **ICPC 2022**
- Finished in **Top 20** at Future Health 2071 Hackathon, UAE
- Invited by **EPFL** for semester exchange, Switzerland 2023
- Invited as **Indian Delegate** by GOI to CYMM, London 2023

Positions of Responsibility

- Secretary, Programming Club IIT Kanpur
- Academic Mentor - Maths, IIT Kanpur
- Project Mentor, Algo101X, Stamatics IIT Kanpur

Relevant Courses

*A** : Exceptional Performnce † : Ongoing

Probability Theory A*	Machine Learning A*	Data Structures, Algorithms A*	Randomized Algorithms A*
Discrete Maths, Algebra A*	Advanced Algorithms A*	Compiler Design A*	Theory of Computation A*
Formal Logic A*	Linear Algebra A*	Operating Systems A	Time Series Analysis †
Computer Networks A	Computer Organization A	Real Analysis A*	Program Verification †