

Harsh Khandelwal

3rd Year Undergraduate
Department of Material Science Engineering

✉ kharsh21@iitk.ac.in | 🌐 Harsh-Khandelwal
☎ +91-8824820519 | in Harsh-Khandelwal

Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2021 - Present	B.Tech	Indian Institute of Technology, Kanpur	6.9/10.0
2020	RBSE(XII)	3D Senior Sec. School, Dausa	89.8%
2018	CBSE(X)	Frame International School, Dausa	91.0%

Scholastic Achievements

- Secured **All India Rank 5776** in **JEE Advanced 2021** among the 1,50,000+ shortlisted candidates
- Secured **All India Rank 9385** in **JEE MAINS 2021** among the 10,00,000+ candidates

Key Projects

Analyzing Firm Performance Outlook leveraging NLP (May'23-Ongoing)

Mentor: Prof. Harshal Rajan Mulay, IME Department, IIT Kanpur

- Analyzed annual reports using textual & sentiment analysis techniques for **Financial performance & Corporate culture**
- Implemented a methodology for evaluating Management Discussion & Analysis Reports of Nifty 500 companies, which included analyzing **readability metrics, lexical diversity, and sentiment** using the **Loughran Mc-Donal Dictionary**
- Created a **Deep learning-based dictionary** to analyze annual reports and predict company growth using **financial performance, language usage, sentiment, and organizational culture**. Advanced **Business analytics** skills

Image Processing & Computer Vision | Stamatics Project | 🌐 Github (Apr'23-Jul'23)

- Utilized advanced computer vision techniques, such as **Image Enhancement, Denoising, and filtering**, to enhance the quality of input images for further analysis. Explored the applications of Special Distribution in image processing
- Developed and deployed algorithms for various computer vision tasks, including **Image segmentation, feature extraction, and Object Recognition, Enabling precise analysis and Interpretation of images** for extracting meaningful information
- Developed & deployed computer vision algorithms using **OpenCV & TensorFlow**, extensively tested on diverse datasets
- Completed a **ML project on Image segmentation**, achieving optimal accuracy with a deep learning model on a large datasets

Probabilistic Thinking | Stamatics Project | 🌐 Github (Apr'23-Jul'23)

- Achieved primary skill in axiomatic probability theory, including probability spaces, conditional probability, Bayes' rule, random variables, expectation, combinatorics, and an efficient **Dynamic programming approach** for computing **Catalan Numbers**
- Obtained an understanding of **Stochastic processes** as well as Markov Chains. Using techniques from **Markov Chain Monte Carlo (MCMC)**, we developed a **Text-generation algorithm** that was then trained on a collection of Shakespeare's works
- Developed and trained a **Bayesian Machine Learning model** on test data, attaining a high R-squared score of more than 0.9 for parameter determination. We found a variable that is uncorrelated with the others, as well as heteroskedasticity in the data
- Gained knowledge in **Randomized algorithms**, including design techniques and mathematical tools for analysis such as **Linearity of Expectation and Chernoff's Bound**. Applied these techniques to develop a simulated-annealing based 9x9 Sudoku solver, capable of computing a correct solution from within a space of size $\sim 10^{26}$ in under 1 second

Unmasking CP | Summer Project: Association of Computing Activities, IITK (May'22-Jul'22)

- Proficient in C++ and STL, mastering essential and advanced algorithms like **Sieve of Eratosthenes, BFS, DFS**, etc
- Participated in programming contests on platforms like AtCoder and Codeforces, showcasing strong problem-solving abilities

Technical Skills

- Programming Languages:** C, C++, HTML, L^AT_EX, CSS, Javascript, Python, Web Scraping
- Software and Libraries:** OpenCv, Numpy, Pandas, Tensorflow, Matplotlib, Fusion 360, Inventor Professional, AutoCad

Positions of Responsibility

Secretary, Chess Club, IIT Kanpur (May'22 - May'23)

- Organised the prestigious **Chess Masters Premier League**, with 80+ participating colleges and 17 esteemed chess luminaries, offering a grand prize of **3.5 Lakh+**. Additionally, held the **IITK Chess League**, featuring **20 accomplished Alumni**
- Engaged in transformative collaboration with **PRAYAS**, to **empower underprivileged students** through the games of chess

Secretary Hospitality & Transport, Antragini, IIT Kanpur (Jul'22 - Apr'23)

- Interviewed and selected Antragini **Campus Ambassadors** based on enthusiasm, communication skills, and peer engagement.
- Organized diverse online competitions in various artistic disciplines, ensuring a successful and memorable event experience

Senior Executive Events, Udhghosh, IIT Kanpur (Jul'22 - Oct'22)

- Led a **Chess event** for the fest, handling all aspects, managed multiple teams, **comprising 70+ players**, also secured sponsors
- Coordinated with fest organizers to obtain permits, and equipment, also demonstrated strong leadership for a successful tournament

Relevant Coursework

* : Excellent Performance

ESO207A: Data Structure and Algorithms ESC101A: Fundamentals of Computing MTH102: Linear algebra and Differential Equations Quantum Physics	Real Analysis and Calculus ESC201A: Introduction to Electronics* ESO202: Mechanics of Solids Thermodynamics
--	--

Extra-Curricular Activities

- Performed Standup** comedy at the Humour House event, **showcasing my comedic skills** and entertaining the audience
- Served as **Hall Captain** in **GC'23 Event Galaxy, Inter-hall competition**, organizing and overseeing hall events and activities
- Actively engaged in **Intra hall competitions**, fostering a friendly competitive spirit and proudly representing my hall