ANUJ NAGPAL

4th Year Undergraduate
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EDUCATIONAL QUALIFICATIONS

Year	Qualification	Institute	Performance
2014-18	Bachelor of Technology, Computer Science and Engineering	Indian Institute of Technology, Kanpur	**9.3**/10.0
2014	AISSCE (Class XII - CBSE)	B. M. M. Sen. Sec. School, Mandi Killianwali	**96.2%**
2012	AISSE (Class X - CBSE)	B. M. M. Sen. Sec. School, Mandi Killianwali	**10.0**/10.0

ACADEMIC ACHIEVEMENTS

- Received **Academic Excellence Award** from IIT Kanpur for the Academic Session 2014-15.
- Secured an **All India Rank of 190** in **JEE Advanced 2014** given by about 150,000 shortlisted candidates from all across the country.
- Secured an **All India Rank of 220** and **State Rank of 4 in Punjab** in **JEE Main 2014** given by about 1,500,000 students.
- Conferred with **Kishore Vaigyanik Protsahan Yojana (KVPY) Scholarship** in 2012 by IISc Bangalore.
- Qualified National Standard Examination in Chemistry (**NSEC**) and National Standard Examination in Astronomy (**NSEA**) in 2013.

INTERNSHIP

- **Summer Analyst, Goldman Sachs Services Bengaluru, Securities Division** *May'17 - Jul'17*

(Mentor: Anshuman Shankar, Vice President, Securities Division)

Role: Development, maintenance and testing of firm's RFQ system used for electronic trading of single name CDS and corporate bonds.

Major Tasks Completed:
- Added support for trading fractional-year tenor single name CDS for a major venue in New York and London.
- Implemented automated scenario tests for e-trading of corporate bonds on a major venue in New York. Anticipated reduction of manual testing effort before every code release.
- Unification of and making robust FIX protocol message dictionaries used for communication during electronic trade negotiations.

Auxiliary Learning:
- Familiarity with Java Object Oriented Programming and all the phases of SDLC.
- Introductory knowledge on trading mechanics of corporate bonds and credit derivatives.

PROJECTS

- **Finding Vulnerabilities and Improving Security of Zoobar Server** *Dr. Sandeep Shukla*
  - Crafted overflow, format string, denial of service and browser based attacks and implemented principle of least privileges in the web server.
- **Deep Reinforcement Learning to Train Against Pong Atari Game AI** *Dr. Piyush Rai*
  - Implemented Q-Learning and Policy Gradient methods in TensorFlow and trained agent was eventually able to win matches.
- **Joint Seat Allocation Algorithm for IITs, NITs, IIITs and other GFTIs** *Dr. Surender Baswana*
  - Implemented a stable marriage algorithm complying with all the rules of JoSAA 2016 and improved the time taken by 70% for some boundary cases.
- **Java to x86 Assembly Compiler** *Dr. Amey Karkare*
  - End-to-End compiler from scratch using Python Lex and Yacc (PLY) incorporating short circuiting, register allocation optimization and classes.
- **Extending Nach Operating System** *Dr. Mainak Chaudhuri*
  - Extended the standard system call library and implemented several process scheduling and page replacement algorithms for NachOS.
- **Online Academic Registration Portal** *Dr. Piyush Kurur and Dr. Satyadev Nandakumar*
  - Made an online portal using Ruby on Rails framework allowing students to request courses during registration and instructors to accept/reject them.
- **Applications of Graph Algorithms in Discrete Markov Chains** *Dr. Avijit Khanra*
  - Made a Matlab Library to easily calculate strongly connected components, periodicity, expected number of visits and hitting probability for all states.
- **Prutor Interface and Database Improvements** *Dr. Amey Karkare*
  - Added admin side modules and features to Prutor, a Node.js platform used to teach programming to 800 first year students every year in IIT Kanpur.
- **Game Strategies using Combinatorial Game Theory** *Dr. Rajat Mittal*
  - Analyzed winning strategies and helpful heuristics for some classical combinatorial games like Nim, Hex, Domineering and Tic-Tac-Toe.

POSITION OF RESPONSIBILITY

- **Coordinator, ACA, Departmental Student Body, CSE IIT Kanpur**

Leadership	- Conducted ACA Summer School open to students from all colleges with around 500 registered students and 5 courses. - Mentored 10 first year students for a semester long project teaching them essential programming languages and utilities. - Responsible for all the departmental activities ranging from freshers' for new batch to farewell to outgoing batch.
Initiatives	- Floated semester projects for 150 first year students under the mentorship of experienced seniors to promote coding culture in campus. - Organized hackathons, programming contests, workshops and talks in collaboration with some reputed companies. - Increased student-faculty and intra-department interaction by organizing happy hours, senior-junior sessions and team fun activities.

RELEVANT COURSES

- Computer Systems Security ***(A*)***
- Computing Laboratory ***(A*)***
- Operating Systems
- Data Structures and Algorithms
- Computer Networks
- Principles of Database Systems
- Compiler Design
- Computer Organization
- Probabilistic Machine Learning
- Applied Stochastic Processes
- Design and Analysis of Algorithms
- Microeconomics ***(A*)***
- Machine Learning Techniques
- Time Series Analysis
- Probability and Statistics
- Macroeconomics

- A* for exceptional performance

TECHNICAL SKILLS

- **Programming Languages**: C, C++, Python, Java, Bash, HTML, CSS, JavaScript, PHP, SQL, R, Go, Scala, Verilog, Assembly
- **Software & Utilities:** Git, LaTeX, Vim, Gnuplot, GNU Octave, MATLAB, Ruby on Rails, Node.js, IntelliJ, Autodesk 3ds Max