RAJBIR MALIK

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Indian Institute of Technology Delhi
Github: jaymalk

EDUCATION

Indian Institute of Technology Delhi *July 2017 - Present*
Sophomore *(Expected 2021)*
Department of Computer Science and Engineering Overall GPA: 9.67/10

EXPERIENCE

Cybersecurity & Cryptography | Tel-Aviv University July 2018 - June 2018
Summer Course, Prof. Amit Kleinmann

- Separately tested and implemented cryptographic primitives including a Block Cipher in CTR mode using a given secure PRF, HMAC from a Merkle-Damgard construction and a one-way trapdoor function based on Elliptic Curves.
- Studied and analyzed various attacks on digital systems and networks, and implemented defenses against common exploits such as Replay attacks, Buffer overflows, Man-in-the-Middle attacks, etc.
- Received the highest grade while competing with students from across the globe with a score of 97/100 in finals.

Electronic Voting Machine Design January 2019 -
Embedded Systems Project, Prof. Subhashis Banerjee

- Design voting machine to conduct institute level elections.
- Implement security measures against various attacks, and verify using formal verification.
- Automated verification and proof-checking for all measures implemented.

Image Processing and Sharpening/Blurring on FPGA October 2018 - November 2018
Course Project, Prof. Anshul Kumar

- Designed, synthesized, and implemented a system to apply basic image processing filters using UART serial protocol based Transmitter/Receiver and a 3x3 sliding window to apply filter coefficients.
- Programmed in VHDL on a BASYS3 FPGA board using Xilinx Vivado, with support for optional PMODs.

Mobile Phone Routing Structure August 2018 - September 2018
Course Project, Prof. Amitabha Bagchi

- Built a standalone system for efficient routing between mobile phone base stations.
- Used k-ary trees and bloom filters along with multithreaded algorithms to find suitable routes while avoiding deadlocks and race conditions.

Search Engine September 2018 - October 2018
Course Project, Prof. Amitabha Bagchi

- Implemented an inverted-index using AVL structures for the search problem.
- Optimized by using Hash-Maps allowing large scale indexing.
- Used cookie data to implement personalized-page rank.

SCHOLASTIC ACHIEVEMENTS

Qualified Regional Mathematical Olympiad, (precursor to IMO) in high school (grade 10 & 11).

JEE Advanced Rank 154 : Ranked 154 Nationally, (amongst 150,000 candidates) in JEE Advanced 2017, **with a perfect score in mathematics** (122/122).

KVPY Fellow : Cleared the KVPY exam, twice, in the categories SA (2017) and SX (2016)

IIT Delhi Merit Award : Awarded IITD Merit Scholarship for being in the top 7 percent in the first and second semester.

Program Upgrade 2017 : Selected for Program Upgrade due to GPA Merit (Ranked 5th at the end of first year).

SKILLS

Computer Languages
Python, Java, C++, Prolog, OCaml (& SML), R

Development
HTML, CSS, JavaScript, Angular, Django & BootStrap

Hardware & Software
Xillinx Vivado and ISE suit, Autodesk Inventor

IMPORTANT COURSES

Discrete Mathematics
Data Structures and Algorithms
Programming Languages*
Computer Architecture*
Digital Logic and System Design
Probability Theory and Stochastic Processes
Signals and Systems*
Laboratory *(Physics, Chemistry, Biology, Electronics)*

** currently pursuing.*

EXTRA-CIRRUCULAR

Water-Polo Captain, Zanskar Hostel (July, 2018 - April, 2019)
Activity Head (Table Tennis), Sportech 2017 : Managed and handled teams the Table-Tennis sport in Sportech 2017

SUMMARY

I have a particular interest in topics from theoretical computer science and mathematics which have real-life applications. These include

- Discrete Mathematics, Set theory, Algebra, Probability.
- Algorithms, Data Structures, Cryptography, Computer security, Machine Learning.

I am a coding enthusiast. I am intrigued by problems that require the best of both worlds (Math and CS) for solutions.