

# KAPIL AHUJA

Mathematics and Computing  
Indian Institute of Technology, Delhi

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## ACADEMIC DETAILS

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Year	Degree	Institution	CGPA/Percentage
2014-2019 (Current)	B.Tech.& M.Tech. in Mathematics and Computing	Indian Institute of Technology Delhi	8.678/10 <b>Department Rank 4</b>
2014	Class XII, CBSE	City International School, Pune	97%
2012	Class X, CBSE	St. Joseph's Convent, Jalgaon	10/10

## SCHOLASTIC ACHIEVEMENTS

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- **All India Rank 75** in **JEE Main-2014** examination, among 1.3 million candidates.
- **All India Rank 499** in Indian Institute of Technology Joint Entrance Examination (**JEE Advanced-2014**).
- Secured **194<sup>th</sup> rank** in the Kishore Vaigyanik Protsahan Yojana (**KVPY**) 2013 examination, SX Stream.
- Placed amongst **top 300** students across India qualified for Indian National Astronomy Olympiad (**INAO**) 2014.
- Undergraduate **Teaching Assistant** for the first course on Electromagnetic waves and Quantum Mechanics.

## INTERNSHIPS

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### Universal Windows Application for Project Sangam

*May, 2017 - July, 2017*

*Microsoft India Development Center*

- The project is based on Microsoft Research's MEC (Massively Empowered Classrooms) project, used by several countries for imparting quality education content to their people and has millions of users.
- Developed the application using Xamarin Forms, which allowed code sharing with the Android version as a Portable Class Library for cross platform use.
- The application is also integrated with LinkedIn, so that users can easily find available job opportunities related to the courses they're currently pursuing.
- The application was designed following the MVVM pattern, so as to render differently on tablets/desktops and cell phones, without the need to rewrite code.

### Aadhaar Authentication on Cell Phones

*May, 2016 - July, 2016*

*Unique Identification Authority of India*

- Designed **Android** application to extract fingerprint data from a phone camera and used it for Aadhaar Authentication. The application works with camera resolutions more than 8 MP.
- Minutiae are extracted from the image and sent for verification against UIDAI's database securely as an XML request.

## MAJOR PROJECTS

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### Android application for *Rendezvous 2016*

*July 2016 - October 2016*

- In a group of two, developed Android application for the cultural festival of IIT Delhi.
- Users can view the festival schedule, event details, event notifications, and registrations.
- Also added a QR scanning feature which was used to award points to event attendees.
- The application currently has 8000 users on the Play Store.

## Discrete Event Simulator of a blockchain cryptocurrency

March, 2017

High Speed Networks Course Project

- Designed a simulator to analyze a cryptocurrency network containing  $n$  peers.
- Nodes have different computation power and each node generates transactions randomly with an exponential distribution and forwards them to neighbours who pass it on to the network.
- Nodes also generate blocks, with block generation times following an exponential distribution, and forward them to peers in a way similar to the proof of work scenario as in the Bitcoin blockchain.

## Travigator - Bus Navigation System

May, 2015 - July, 2015

Summer Project

- Developed an Android application, primarily designed to assist visually impaired for alighting at a specified destination while traveling in buses.
- The application announces bus stops when in nearby vicinity and also works offline with saved routes.

## OTHER PROJECTS

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### Background Subtraction

Prof. S. D. Roy

Machine Learning Course Project

Jan., 2017 - Feb., 2017

Implemented the Stauffer Grimson Algorithm for background subtraction in C++. The program separates foreground and background in real time video feed, and is based on Gaussian Mixture Models.

### Denial of Service Attacks

Prof. Vinay Ribeiro

High Speed Networks Course Project

April, 2017

Analyzed file download time over a network under various DoS attacks such as the SYN Flood, HTTP POST and the UDP flood attacks using *LOIC*. Also used *Snort* for detecting intrusion into servers and preventing them.

### Network Based Multiplayer Ping Pong Game

Prof. Vinay Rebeiro

Design Practices Course Project

April, 2016

Designed and implemented a 4 player, P2P networking based Ping Pong game using Java Swing Library for Graphics rendering and UDP Socket programming for network connections. Game included reconnection, power ups and replaced disconnected players with an AI bot.

## RELEVANT COURSES

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### • Computer Science

Machine Learning, Logic and Functional Programming, Computer Networks, High Speed Networks, Computer Vision, Data Structures & Algorithms, Discrete Mathematics and Design Practices

### • Mathematics

Probability, Statistical Methods, Linear Algebra, Optimization, Game Theory and Calculus.

## TECHNICAL SKILLS

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**Languages:** C++, C, Java, Python, C#

**Programming Environments:** Android Studio, Visual Studio

## EXTRA CURRICULAR ACTIVITIES

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- Runner Up in **Code.Fun.Do** - January, 2015 organized by **Microsoft** at IIT Delhi.
- Runner Up in **HackX** - January, 2016 organized by **Nutanix** at IIT Delhi.
- Runner Up in **Logicape**, **Ghost Code** and **Code Hunt** during **Tryst '17** at IIT Delhi.
- Member of the Quizzing League, winner of Occam's Razor 2017 and runner up in Freshers' Quiz 2014 at IITD.