

# Saksham Sharma

PRE-FINAL YEAR UNDERGRADUATE · COMPUTER SCIENCE AND ENGINEERING

Indian Institute of Technology Kanpur

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## Education

### Indian Institute of Technology Kanpur

Kanpur, India

BACHELOR OF TECHNOLOGY, MAJOR IN COMPUTER SCIENCE AND ENGINEERING

2014 - 2018 (Expected)

- Institute Rank 1 among 830 students. Cumulative Grade Point / **GPA: 10.0/10.0**

## Honors & Awards

2015	<b>Academic Excellence Award</b> , Institute Rank 1	IIT Kanpur
2014	<b>Aditya Birla Group Scholarship Awardee</b> , Among 15 top students from all IITs	Mumbai, India
2014	<b>All India Rank 10</b> , Joint Entrance Exam Mains, 1.5 million candidates	India
2014	<b>All India Rank 138</b> , Joint Entrance Exam Advanced, 150,000 candidates	India
2014	<b>Merit Certificate Awardee, Overall 97.6%</b> , Grade 12 national examination	India
2013	<b>KVPY Scholarship Awardee</b> , Indian Institute of Science and Government of India	Bangalore, India
2010	<b>NTSE Scholarship Awardee</b> , Government of India	India

## Work Experience

### Max Planck Institute for Software Systems

Saarbrücken, Germany

RESEARCH FELLOW, UNDER DR. EVA DARULOVÁ

May. 2016 - Jul. 2016

- Developed and evaluated a Scala tool to rewrite mathematical floating-point expressions and increase their accuracy using a genetic algorithm.
- Obtained successful results, improving expression errors by ~50%, useful for scientific and embedded applications.
- Part of a larger tool for optimizing numeric expressions, will hopefully appear in publication soon.

### New York Office, IIT Kanpur

Kanpur, India

FULL STACK DEVELOPER, UNDER PROF. MANINDRA AGARWAL

May. 2015 - May. 2016

- Adjudged as one of the best interns, while being a freshman
- Worked on a scale-able application in a polyglot environment with an extensive technology stack.
- Designed and implemented a full search component (ElasticSearch and Angular) from scratch.
- Implemented code evaluation, attachment support and front-end functionality.
- Technology used: Scala with Akka, Node.js with Express, Angular with TypeScript, ElasticSearch

## Projects

### moVi: Mobile Video Chat Protocol [github.com/netsecIITK/movi](https://github.com/netsecIITK/movi)

IIT Kanpur

UNDERGRADUATE PROJECT, PROF. SANDEEP SHUKLA

Aug. 2016 - Present

- Working on developing a protocol for video communication vis-a-vis Mosh (mobile shell).
- Using UDP to set up a connection-less and secure channel, persistent across network IP and location changes.
- Trade-off between video quality, stuttering rate vs network resources and reliability required.
- Exploring, devising ways for transmitting video with minimum requirements, distortion with UDP packets.

### Anonymous and private pair matching platform

IIT Kanpur

COURSE PROJECT, PROF. PIYUSH KURUR AND PROF. SATYADEV NANDAKUMAR

Oct. 2016 - Present

- Designed and in the process of implementing an algorithm for fully anonymous matching of couples.
- Allows the end users to put zero trust in the server (admin), irrespective of code on the backend.
- Using homomorphic two party computation (assisted by an un-trusted server backend) and asymmetric encryption to ensure confidentiality and integrity.

## HOP: HTTP proxy for arbitrary protocols [acehack.org/hop](http://acehack.org/hop)

IIT Kanpur

UNDERGRADUATE PROJECT, PROF. SANDEEP SHUKLA

Aug. 2016

- A proxy to wrap and unwrap arbitrary binary data from/to HTTP packets, to bypass possible proxy restrictions.
- Stayed in **top 5** of *Github's trending repositories* in C++ for 2 days.

## ABU Robocon 2015, Badminton playing robots

IIT Kanpur

MEMBER, TEAM ROBOCON IIT KANPUR, PROF. BHASKARDAS GUPTA

Oct. 2014 - Mar. 2015

- Programmed and built 2 semi-autonomous robots capable of playing badminton on a standard size court.
- Used image processing with OpenCV to detect the shuttle and predict its trajectory.
- Used Kinect and Stereo Vision to get depth of field. Programmed the robot using Arduino run by Odroid.
- Finished 11th among 85 teams all over India.

## Network Concepts Implementation

IIT Kanpur

COURSE PROJECT, COMPUTER NETWORKS, PROF. SANDEEP SHUKLA

Aug. 2016 - Present

- Wrote an HTTP Server, an HTTP Proxy and an implementation of STCP Protocol using socket programming.

## Microsoft code.fun.do hackathon

IIT Kanpur

CONSECUTIVE TWO TIME HACKATHON WINNER

Jan. 2015, Sept. 2015

- An application to parse and plot graphs of implicit mathematical functions using C#.
- A platform to learn coding, with a custom online judge written in Node.js. National 5th (coding milestone).

## Extracurricular Activity

### Coordinator

IIT Kanpur

PROGRAMMING CLUB, INFORMATION SECURITY GROUP

Apr. 2016 - Present

- Rewrote, deployed, populated club website [pclub.in](http://pclub.in)
- Organize and conduct workshops lectures on programming topics.
- Set problems for and organize various programming contests, capture the flag contests on campus.

### Software Corner Manager

IIT Kanpur

TECHKRITI 2016, IIT KANPUR'S NATIONAL TECHNICAL FEST

Dec. 2015 - Mar. 2016

- Made an esoteric language based on stack machines for a national competition.
- Wrote an online judge for a High Performance Computing contest run on the Param YUVA II supercomputer.

## Skills

**Programming** C/C++, Scala, Python, Node.js, Haskell, Lisp

**Web** Express.js with Node.js, Akka with Scala, JavaScript, TypeScript, Angular

**Operating Systems** Gentoo Linux, Arch Linux, Ubuntu

**Utilities** Emacs and Vim both,  $\text{\LaTeX}$ , Linux shell utilities, Git, Docker, Kubernetes, GDB, Elasticsearch

## Coursework

A\* Data Structures and Algorithms

A\* Introduction to Programming

A Computer Systems Security

A Abstract Algebra, Logic

i Computer Networks

A\*: Grade for exceptional performance

A\* Computer Organization

A\* Tools for Computing

A Discrete Mathematics

i Programs, Proofs and Types

i Operating Systems

A: grade

i: In progress

## Miscellaneous

- Blog about Networks, Linux, and programming in general at [acehack.org](http://acehack.org)
- Contribute to open source and maintain my projects on Github
- Microsoft Build The Shield 2016, National 10th in final, on-site Capture The Flag contest.
- Administer student servers in IIT Kanpur, including a community Gentoo mirror, deploying and managing services for the campus community.