

# Saksham Sharma

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 / **CGPA: 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

### Software Engineering Intern, Google Seattle

Seattle, WA

GKE/KUBERNETES SECURITY TEAM

May. 2017 - Jul. 2017

- Worked on Kubernetes, Google Cloud's open source Docker container orchestration platform, to encrypt resources in cluster database at rest, a feature requested by industry for security hardening.
- Implemented envelope encryption using Key-Encryption-Keys and Data-Encryption-Keys to allow using remote cloud-based Key Management Services.
- Designed a method for allowing key rotations in a distributed system with a shared database.
- Feature released as alpha in v1.7, integration with Google's Key Management System on track for v1.8.
- Collaborated with engineers across companies for designing the feature.

### 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%, 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 - Apr. 2016

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

## Projects

### Tipsy: Tool to provide tips and corrections for MOOC submissions

IIT Kanpur

UNDERGRADUATE PROJECT, PROF. AMEY KARKARE

Jan. 2017 - Apr. 2017

- Created a tool in Scala to parse, analyze and classify C programs from large programming courses, to help provide suggestions and tips to weak students.
- Reduced C programs to a linear high level representation, which was later used for finding shortest distance between 2 programs.
- Classified programs to provide suggestions to students based on programs similar to their submission.

## Amigo: A 4-stage x64 Compiler for Golang

IIT Kanpur

COURSE PROJECT, PROF. AMEY KARKARE

Jan. 2017 - Apr. 2017

- Implemented a compiler for a fully functional subset of the Go language, in C++ and Python.
- Used flex and bison to obtain an AST, which is later translated to a x64 assembly.
- Implemented pointers, multiple return values, deeply nested arrays, among other features; along with some low level optimizations.

## Anonymous and private pair matching platform [acehack.org/puppy](http://acehack.org/puppy)

IIT Kanpur

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

Nov. 2016 - Feb. 2017

- Designed and implemented an algorithmic platform for anonymous pair/couple matching.
- Ensures that users' choices are not made known even to the server admin.
- Used Diffie-Hellman like token exchange over an honest-but-curious server backend, asymmetric encryption to ensure confidentiality and fairness even during matching.

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

IIT Kanpur

UNDERGRADUATE PROJECT, PROF. SANDEEP SHUKLA

Sept. 2016 - Nov. 2016

- Developed a client for video communication akin to Mosh (mobile shell).
- Used UDP to set up a connection-less and secure channel, persistent across network IP and location changes.
- Implemented State Synchronization Protocol, UDP Hole Punching, and dynamic tweaking of video quality.

## 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 the 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.

## Extracurricular Activity

### Coordinator PROGRAMMING CLUB, INFORMATION SECURITY GROUP

Apr. 2016 - Apr. 2017

- 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 TECHKRITI 2016, IIT KANPUR'S NATIONAL TECHNICAL FEST

Dec. 2015 - Mar. 2016

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

### Microsoft code.fun.do hackathon CONSECUTIVE TWO TIME HACKATHON WINNER

Jan. 2015, Sept. 2015

- An application to parse and plot graphs of implicit mathematical functions using C#, for Windows Phone.
- A platform to learn coding for Windows Phone, with a custom online judge written in Node.js.

## Skills

**Programming** C/C++, Scala, Golang, Python, Node.js

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

**Utilities** Linux shell utilities, Git, Docker, Kubernetes, GDB, ElasticSearch,  $\LaTeX$ , Emacs and Vim

## Relevant Coursework

A\* Computer Networks

A\* Operating Systems

A\* Compiler Design

A\* Computer Organization

A\* Modern Cryptology

A\* Algorithms

A\* Introduction to Programming

A Computer Architecture

A Computer Systems Security

A\*: Grade for exceptional performance

A: grade

## Miscellaneous

- Contribute to open source, maintain some well appreciated projects on Github
- Microsoft Build The Shield 2016, National 10th in final, on-site Capture The Flag contest.
- Administer a cloud in IIT Kanpur, deploying and managing services for the campus community.