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*
- Institute Rank 1 among 830 students. Cumulative Performance Index / **CGPA: 10.0/10.0**

Honors & Awards

2016	**Academic Excellence Award**, Institute Rank 1 with a GPA of 10/10 in all 8 semesters	*IIT Kanpur*
2014	**Aditya Birla Group Scholarship Awardee**, Awarded to 15 students from all IITs	*Mumbai, India*
2014	**All India Rank 10**, Joint Entrance Exam Mains, 1.5 million candidates	*India*
2014	**All India Rank 138**, Joint Entrance Exam Advanced, 150,000 candidates	*India*
2014	**Merit Certificate Awardee, Overall 97.6%**, Grade 12 national examination	*India*
2013	**KVPY Scholarship Awardee**, Indian Institute of Science and Government of India	*Bangalore, India*
2010	**NTSE Scholarship Awardee**, Government of India	*India*

Work Experience

GKE/Kubernetes Security Team, Google Seattle *Seattle, WA*
SOFTWARE ENGINEERING INTERN, GOOGLE CLOUD *May. 2017 - Jul. 2017*
- Worked on Kubernetes, Google'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.
- Feature released as alpha in v1.7, integration with Google's Key Management System and others is upcoming.
- Collaborated with engineers across multiple companies. Received a returning job offer.

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.
- **In proceedings** of the 9th ACM/IEEE International Conference on Cyber-Physical Systems.

New York Office, IIT Kanpur *Kanpur, India*
FULL STACK DEVELOPER, UNDER PROF. MANINDRA AGARWAL *May. 2015 - Apr. 2016*
- Worked on a scalable microservice based web application with an extensive technology stack.
- Designed and developed critical backend features while ensuring type-safety.
- Developed and deployed the complete search functionality (using ElasticSearch, Scala, TypeScript).
- Adjudged as one of the best interns, while being a freshman.

Projects

Tipsy: Tool to provide tips and corrections for C programs en masse *IIT Kanpur*
UNDERGRADUATE PROJECT, PROF. AMEY KARKARE *Jan. 2017 - Apr. 2017*
- Developed 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. Used it to find similar features between programs, thus allowing discovering corrections in a program using reference programs.
- Classified programs to provide suggestions to students based on programs similiar to their submission.
- **In proceedings** of the 19th International Conference on Artificial Intelligence in Education, London.

Anonymous and private couple matching platform
COURSE PROJECT, PROF. PIYUSH KURUR AND PROF. SATYADEV NANDAKUMAR

IIT Kanpur
Nov. 2016 - Apr. 2017

- Designed an algorithm and implemented a 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, along with asymmetric encryption, to ensure confidentiality and fairness even while matching people.
- Deployed on campus for a week, with 1800+ users and 45 matches.

Amigo: A 4-stage x64 Compiler for Golang
COURSE PROJECT, PROF. AMEY KARKARE

IIT Kanpur
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, with some assembly level optimizations.

moVi: Video Application for mobile networks
UNDERGRADUATE PROJECT, PROF. SANDEEP SHUKLA

IIT Kanpur
Sept. 2016 - Nov. 2016

- Developed a Linux client for video chatting, based on 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
MEMBER, TEAM ROBOCON IIT KANPUR, PROF. BHASKARDAS GUPTA

IIT Kanpur
Oct. 2014 - Mar. 2015

- Programmed and built 2 semi-autonomous robots capable of playing badminton on a standard size court.
- Used OpenCV, Kinect and Stereo Vision to detect the shuttle, and predict its trajectory.
- Finished 11th among 85 teams all over India.

Extracurricular Activity

Coordinator PROGRAMMING CLUB AND INFORMATION SECURITY GROUP, IIT KANPUR   *Apr. 2016 - Apr. 2017*

- Rewrote, deployed and populated the club website at pclub.in
- Organized and conducted workshops and lectures on programming topics.
- Set problems for, and organized various programming and capture the flag contests on campus.

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.

Teaching Assistant DATA STRUCTURES AND ALGORITHMS, PROF. SUMIT GANGULY   *Aug. 2017 - Present*

Skills

Programming	C/C++, Scala, Haskell, Golang, Python, Node.js
Web	Akka with Scala, JavaScript, TypeScript, Angular
Utilities	Linux shell utilities, Git, Docker, Kubernetes, GDB, ElasticSearch, LaTeX

Relevant Coursework

A∗ Computer Networks	A∗ Operating Systems	A∗ Compiler Design
A∗ Computer Organization	A∗ Modern Cryptology	A∗ Data Structures and Algos
A∗ Distributed Systems	A∗ Functional Programming	A Programs Proofs and Types
A Adv. Compiler Optimizations	A Computer Architecture	A Computer Systems Security

A∗: Grade for exceptional performance   *A: grade*

Miscellaneous

- Blog about programming topics and functional programming at sakshamsharma.com
- Contribute to open source projects like Kubernetes, maintain some well appreciated projects on Github.
- Microsoft Build The Shield 2016, National 10th in final, on-site Capture The Flag contest.
- Administered a cloud in IIT Kanpur, deploying and managing services for the campus community.