

Saksham Sharma

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WORK EXPERIENCE

Software Engineering Intern May-Jul'17
Google Seattle, GKE/Kubernetes Security Team

- Worked on Kubernetes, Google's Open Source Docker / container orchestration platform, to encrypt resources at rest, in cluster database (etcd).
- Feature required by industry for security hardening and protection of clusters.
- Used envelope encryption using Key-Encryption-Key and Data-Encryption-Key to allow using a remote root-of-trust for encryption.
- Allowed key rotations in a multi-master system.
- Feature released in v1.7, integration with Google's Cloud Key Management service upcoming.

Summer Research Fellow May-Jul'16
Max Plank Institute, Germany, under Dr. Eva Darulová

- Developed, evaluated a Scala tool to rewrite mathematical floating-point expressions and increase their accuracy using a genetic algorithm.
- Decreased floating point errors in expressions by 50%, useful for scientific and embedded uses.

Full Stack Developer May'15-Apr'16
NYC Office IIT Kanpur, Prof. Manindra Agarwal

- Worked on a large-scale microservice based web application with an extensive and polyglot stack.
- Implemented critical backend functionality, including program evaluation, attachment support.
- Designed, implemented and deployed the full search functionality using Scala, Elasticsearch, TypeScript.

EDUCATION

2014–Now **Bachelor of Technology**
Computer Science, IIT Kanpur
CGPA: 10.0/10.0

AWARDS AND ACHIEVEMENTS

Now **Institute Rank 1, IIT Kanpur**
SPI/GPA: 10.0 in all 6 Semesters
2016 **Academic Excellence Award**
IIT Kanpur, 2015 and 2016
2014 **All India Rank 10**
JEE Mains, 1.5 million candidates
2014 **All India Rank 138**
JEE Advanced, 150,000 candidates
2014 **Aditya Birla Scholarship**
Among 15 top students from all IITs
2014 **National Merit, Overall 97.6%**
Grade 12/High School, CBSE
2013 **KVPY Scholarship awardee**
Scholarship by IISc, Govt. of India
2010 **National Talent Search (NTS)**
Scholarship by Govt. of India

PROJECTS

Tipsy: Tool to provide tips and corrections for C programs en masse

Undergraduate project, Prof. Amey Karkare

- Created a tool in Scala to analyze and cluster C programs from large programming courses, to provide tips to weak students.
- Reduced C programs to a linear high level representation, which was later used for finding shortest distance between 2 programs.
- Tool provides corrections and hints based on similar programs in the corpus.

Anonymous and secure couple-matching

Prof. P. Kurur, Prof. S. Nandakumar

- Designed, implemented an algorithm for completely anonymous matching of couples, where end users put zero trust in the server (admin) and its code.
- Use Diffie Hellman inspired secure two party computation to ensure confidentiality and integrity.
- Deployed on campus, used by 1800 users.

Amigo: A 4-stage x64 Compiler for Golang

Course project, Prof. Amey Karkare

- 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.

COURSEWORK

- Operating Systems A* • Compiler Design A*
 - Modern Cryptology A* • Systems Security
 - Computer Organization A* • Algorithms A* • Computer Networks A* • Computer Architecture
 - Introduction to programming A*
- A*: grade for exceptional performance

TECHNICAL SKILLS

LANGS C/C++, Go, Scala, Python, Node.js
WEB Express.js, Akka, TypeScript, Angular
UTILS Git, Kubernetes, Elasticsearch

MISCELLANEOUS

- Won **Microsoft code.fun.do** hackathon **twice**.
- **Coordinator** of Programming Club & InfoSec; organized contests, CTFs, lectures (pclub.in).
- Administer **servers** in IIT Kanpur; deploying, automating services for campus community.
- Microsoft Build The Shield, National 10th in the final round of **CTF**.