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 container orchestration platform, to encrypt resources in cluster database, required by industry for security hardening.
- 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 on track for v1.8.

Summer Research Fellow *May-Jul'16*
Max Plank Institute for Software Systems, Germany
Fellowship, 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

- Implemented various features in a large scale polyglot web application with an extensive technology stack in a team setup (Phabricator, Git)
- Designed and wrote the complete search stack in Node.js, 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

2015 **Academic Excellence Award**
IIT Kanpur, 2014-2015

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 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.
- Clustered programs to provide corrections based on similar programs.

Private secure couple-matching
Prof. P. Kurur, Prof. S. Nandakumar

- Designed, implemented an algorithm for secure, 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, was used by 2000 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 IITK; organize 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**