

# Shivanshu Singh

FINAL YEAR UNDERGRADUATE

Indian Institution of Technology Kanpur

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## Education

### Indian Institution of Technology Kanpur

BACHELOR OF TECHNOLOGY, MAJOR IN MECHANICAL ENGINEERING

- Cumulative Performance Index / CGPA: 8.1/10

Kanpur, India

2014-2018 (Expected)

## Work Experience

### Auto Scaling of Microservices running on docker containers

SOFTWARE INTERN, AUTODESK (RECEIVED PRE-PLACEMENT OFFER)

- Worked on adding the auto-scaling functionality for containers of DC/OS cluster running microservices.
- Designed, implemented and deployed the required architecture in AWS cloud. (using Lambda functions, Redis database, Cloud-Watch and a SNS topic)
- Employed a machine learning technique to make the calculated guess of amount of scaling (up/down) for each service.

Pune, India

May, 2017 - July, 2017

## Projects

### Secure Memory Deduplication and Covert Channel Construction in Linux Kernel

COURSE PROJECT, PROF. DEBADATTA MISHRA

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IIT Kanpur

Sep. 2017 - Nov. 2017

### Large Margin Multi-Modal RGBD Object Recognition

COURSE PROJECT, PROF. VINAY NAMBOODIRI

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IIT Kanpur

Sep. 2017 - Nov. 2017

### Securing Zoobar Server

COURSE PROJECT, PROF. SANDEEP SHUKLA

- Simulated various exploitations in a web application called Zoobar, written in C and serving CGI scripts.
- Employed control hijacking techniques like buffer overflow, integer overflow and format string attacks to exploit the vulnerabilities.
- Performed various browser-based attacks like SQL injection, XSS, CSRF on Zoobar web application.
- Fixed security bugs in web server, implemented privilege separation and server-side sand-boxing.
- Demonstrated the limitations of various mitigation techniques like stack canaries, address space layout randomization (ASLR) etc.

IIT Kanpur

Jan. 2017 - Apr. 2017

## Hackathons

### AMR (Advanced Motion Recognition) System

WINNER, 24-HOURS HACKATHON, MICROSOFT'S CODE.FUN.DO

- Designed and developed an android app to make the android device a 3D controller to control a uploaded CAD model.
- Used three.js to load and render the model on the browser exposing the APIs to control its orientation and location on the display.
- Established a real time and reliable communication between the android device and the web browser using websockets.

Apr. 2017

### HashTag

WINNER, 24-HOURS HACKATHON, GOOGLE DEVELOPER GROUP

- Implemented a file management system on the android device using tags that has superior accessibility capabilities as opposed to conventional file management system.
- Used linked list semantic to manage the mapping between files/folders and tags, and stored them into the SQLite database.

Nov. 2016

## Mini Projects

- Implemented various locking mechanisms like spin lock, semaphores, sequential lock, RCU etc. in linux kernel and compared them empirically.
- Built chat room for processes, when in kernel mode, using a char device and employing the monolithic nature of linux kernel.

- Studied and presented various proof methods like coinduction, fusion etc. for corecursive programs of functional languages.
- Conceptualised and designed a responsive website for Cultural Council using CodeIgniter MVC framework, jQuery etc.

## Technical Skills

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**Programming** C/C++, Python, Haskell, bash scripting

**Software and utilities** Linux shell utilities, Docker, Vim, Emacs,  $\text{\LaTeX}$ , PyTorch, ROS

**Operating Systems** Arch Linux (with i3wm and xmonad), Debian Linux (Ubuntu, Kali)

## Relevant Courses

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Computer Systems Security(A)

Computer Organization\*

Introduction to Programming(A)

Linux Kernel Programming(F)

Principles of Programming Languages(F)

Modern Cryptography\*

*\* ongoing courses*

## Miscellaneous

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