

# Karan Grover

+91 9818148131, [karan13048@iiitd.ac.in](mailto:karan13048@iiitd.ac.in)  
Codechef: [@krngrvr09](#) | Github: [@krngrvr09](#)

## Work Experience

### Research Fellow | Microsoft Research

March '18 - Present

- Worked on Sankie - An AI platform for Devops. Developed a method to report the tests that are most likely to fail after a commit in a collaborative software project to save testing time and resources.
- Built an end-to-end system to provide practical & secure inference-as-a-service using Intel SGX.
- Demonstrated side channel attacks on Intel SGX using memory access patterns and developed an automatic way to prevent them on any DNN Framework written in C/C++.
- Presented our work in Microsoft's annual research showcase: Microsoft TechFest '18.

### Research Assistant | LiveLabs, Singapore Management University

June '16 - Dec '16

- Developed a system to identify item interactions of customers in a retail store through sensor data fusion from smartwatches, smartphones and distributed BLE beacons. Presented our work in ISWC '18.
- Developed an ML model to use the inertial sensor data from a smartwatch to recover the text typed on a smartphone keyboard. Presented our results in PerCom Workshop '17 in Hawaii.

### Research Intern | Precog Research Group, IIIT Delhi

May '15 - Aug '15

- Worked on a tool to connect identities of malicious profiles across OSNs using different profile attributes.
- Worked with technologies like Ruby on Rails, Apache Storm, Redis and MongoDB to scale up the project to support hundreds of queries per second.

### Software Engineering Intern | Nexleaf Analytics, Los Angeles

May '15 - Sep '15

- Worked on the Coldtrace Project to bring real time transparency into vaccine supply chains.
- Developed an App Store for a smartphone to manage applications remotely using a dashboard.
- Developed a dashboard on Ruby on Rails to control the mobile devices and monitor their health in real time.

### Full Stack Developer | Backpack Labs, IIIT Delhi

May '14 - Mar '15

- Backpack is a Learning Management System built for instructors.
- Lead the development of 2 features of the product from concept to production release on Ruby on Rails.
- Built the Android App from scratch, which had around 10,000 users its peak.

## Published Research

### Privado: Practical and Secure DNN Inference (Submitted)

USENIX Security '20

- Built an end-to-end SGX-based DNN Inference System.
- Privado converts any DNN framework in C/C++ to be free of input-dependent access patterns.
- Given an ONNX description, Privado generates C code for the model to run within SGX-enclaves.
- Privado has low performance overhead of 20.77% on average as tested on 10 contemporary networks.

### I4S: capturing shopper's in-store interactions

ISWC '18

- Worked on a project to provide fine-grained insights into shopper's preferences using wearable devices
- Developed Indoor Localization and Gesture Recognition techniques to localize pick gestures.
- Conducted 3 IRB Approved User studies and achieved an accuracy of 92% for fine-grained pick Localization.

- Worked on inferring keypress on a smartphone using inertial sensor data of a smartwatch.
- Concluded that we can infer the user's entry pattern on a qwerty keyboard, with an error bound of  $\pm 2$  neighboring keys, with 73.85% accuracy.

---

**Monitoring of Android Devices Using SNMP**

COMSNETS '16

- Built SNMP Agent for Android Operating System implementing SNMP version I, II and III.
- Performed benchmark tests on the Agent and measured its performance on the phone and in challenging networks like 2G and 3G showing that it can be used in real networks.

---

**Projects****Dockerized SDN Switch using P4 Language**

- Explored the [P4 Language](#) and implemented a L2 Switch and Router in a mininet network.
- Implemented the switch on Docker and tested it in a virtual network implemented on [Mininet](#).

---

**Automatic Video Annotation for Cricket Videos**

- Developed a system for auto annotation of cricket videos from video and commentary text.
- Developed a Question-Answer system on top to answer questions about the cricket match.

---

**Linux File System Emulator using C++**

- Implemented custom ACLs to override DAC using setuid(and related) system calls.
- Implemented basic linux commands in C++ to read/write files and move across directories while enforcing permissions.

---

**SDN Switch using POX in a mixed topology**

- Implemented Firewall, Packet Analyzer, Load Balancer and L2 Switch using [POX Controller](#).
- Demonstrated the capabilities of the system on a virtual network implemented on Mininet.

---

**Awards and Achievements****Winner, Securing the Grid Hackathon | ISGW**

- The challenge was a 'Capture The Flag (CTF)' which involves participants to hack into a SCADA system, toggle a switch and exit the system.

---

**Winner, Hack InOut, SVNIT | Surat, Gujarat**

- Built a system to provide internet to rural areas in India via phone call. A personal assistant which can be reached through a phone call and responds via SMS.

---

**Winner, Hardware Hackathon | Research Showcase, IIIT Delhi**

- Built 'Smart Pots' that used weather forecast data and the moisture content of the soil to predict whether or not to water the plants and send mobile notifications for the same.

---

**Education**

IIIT Delhi BTech(CSE)	2013 - 2017 CGPA: 7.77
Salwan Public School Board: CBSE	2011 - 2013 Percentage: 92.3%
Salwan Public School Board: CBSE	2001 - 2011 CGPA: 9.6