Karan Grover

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PUBLICATIONS

- **Privado: Practical and Secure DNN Inference**: EuroSys 2020 (Submitted)
- **I4S: capturing shopper's in-store interactions**: ISWC 2018
- **Inferring smartphone keypress via smartwatch inertial sensing**: WristSense 2017
- **Monitoring of Android devices using SNMP**: COMSNETS 2016

EXPERIENCE

- **Microsoft Research** — Bangalore, IN
  Software Engineer — *Oct 2019 - Present*
  - **Blockchain**: Working on building a high throughput blockchain protocol on mobile devices. Making the protocol more resilient to malicious actors and more efficient for mobile devices.
  - **Cloud Application**: Working to translate the proof-of-concept blockchain protocol into a production-level cloud application. The application would enable philanthropic donations to be as transparent as direct charity.

- **Microsoft Research** — Bangalore, IN
  Research Fellow — *Feb 2018 - Aug 2019*
  - **Intel SGX**: Developed a Practical and Secure DNN Inference Service using Intel SGX called Privado. Developed a way to automatically convert any trained DNN Model from ONNX Format to enclave-specific code.
  - **Side Channel Attack**: Demonstrated access pattern based side channel attack on DNNs running on SGX. Implemented a method to automatically make Torch C Library input-oblivious using LLVM Compiler.
  - **System Evaluation**: Conducted a comprehensive performance evaluation of the system based on execution time, memory usage, page faults, obliviousness and size of the Trusted Code Base.

- **LiveLabs, Singapore Management University** — Singapore
  Research Assistant — *Jun 2016 - Dec 2016*
  - **Lifestyle Analytics**: 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.
  - **Side Channel Attack**: Explored the possibility of using the inertial sensor data obtained from a smartwatch as a side-channel to infer what is being typed on the smartphone. Presented our work in WristSense Workshop '17.

- **Precog Research Group** — New Delhi, IN
  Research Intern — *May 2015 - Aug 2015*
  - **Privacy in OSM**: Worked on a system to connect identities of malicious profiles across OSNs(Facebook, Twitter and Google+) 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.

- **Nexleaf Analytics** — Los Angeles, CA
  Full Stack Developer — *May 2015 - Sep 2015*
  - **Ruby on Rails**: The Coldtrace Project aims to bring real time transparency into vaccine supply chains. A smartphone is placed inside a refrigerator with medicines which communicates with the sensors to monitor the internal conditions. Developed a dashboard which shows real time information from the smartphones.
  - **Android**: Developed an App Manager for the smartphone which relays data to and from the central server. Implemented compression techniques and partial requests to address problems of unreliable network conditions.

- **Backpack Labs** — New Delhi, IN
  Full Stack Developer — *May 2014 - Mar 2015*
  - **Ruby on Rails**: Backpack is a Learning Management System built for instructors. Lead the development of two product features from conception to production release. Implemented web caching to speed up the website.
  - **Android**: Developed the Android App supporting all the features of the website. Enabled offline support using SQLite databases. Integrated Google Analytics and supported greater than 500 daily sessions.

PROJECTS

- **Dockerized SDN Switch using P4 Language**: Implemented a L2 Switch and Router in a mininet network using P4 Programming Language. Also implemented the switch in docker to create a read-to-use docker image.
- **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 basic commands in C++ to read, write and move files in linux while enforcing permissions. Implemented custom ACLs to override DAC using setuid(and related) system calls.
- **SDN Switch using POX in a mixed topology**: Implemented Firewall, Packet Analyzer, Load Balancer and L2 Switch using POX Controller and tested them on multiple topologies on the Mininet Network Emulator

AWARDS AND ACHIEVEMENTS

- **Winner, Securing the Grid Hackathon**: Organized by Ministry of Power in the Government of India. A 'Capture The Flag' event in which we were supposed to break into a SCADA system.
- **Winner, Hack InOut, SVNIT**: Biggest Community Hackathon in India with over 50 teams participating. Built a voice layer over Google Search that could answer users' queries over phones. Developed for rural areas with no internet.
- **Winner, Hardware Hackathon**: Developed Smart Plant Pots using Raspberry Pi which alert their owners about watering them based on soil humidity and weather prediction.

POSITIONS OF RESPONSIBILITY

- **Organizer, Mid Semester Hackathon**: Helped Organize the Mid Semester Exam in the form of a hackathon for the course CSE 648: Privacy and Security in Online Social Media.
- **Representative, Student Council**: As the member of the Student Council, I started a weekly mentorship program in my university where senior students can volunteer to mentor junior students in their academics.
- **Speaker, Open Source Developer Conference**: I conducted a two hour workshop for students in Delhi on the basics and internals of Git. Helped around 150 students collaborate on their first project through Github.

EDUCATION

- **Indraprastha Institute of Information Technology** — Delhi, India
  Bachelor of Technology in Computer Science; CGPA: 7.75/10 — *Aug 2013 – Dec 2017*

- **Salwan Public School** — Delhi, India
  12th Std. CBSE; Percentage: 92.3% — *Aug 2012 – Aug 2013*

- **Salwan Public School** — Delhi, India
  10th Std. CBSE; GPA: 9.6/10 — *Aug 2010 – Aug 2011*