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**PUBLICATIONS**

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- **Karan Grover**, Shruti Tople, Shweta Shinde, Ranjita Bhagwan, Ramachandran Ramjee. Privado: Practical and Secure DNN Inference. In EuroSys 2020: ACM EuroSys Conference on Computer Systems. **[In Submission]**
- Sougata Sen, Archan Misra, Vigneshwaran Subbaraju, **Karan Grover**, Meera Radhakrishnan, Rajesh Krishna Balan, Youngki Lee. I4S: capturing shopper's in-store interactions. ISWC 2018: Proceedings of ACM International Symposium on Wearable Computer.
- Sougata Sen, **Karan Grover**, Vigneshwaran Subbaraju, Archan Misra. Inferring smartphone keypress via smartwatch inertial sensing. In WristSense 2017: IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops).
- **Karan Grover**, Vinayak Naik. Monitoring of Android devices using SNMP. In COMSNETS 2016: 8th International Conference on Communication Systems and Networks (COMSNETS).

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**EXPERIENCE**

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- **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

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- **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 ready-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

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- **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

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- **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

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| • <b>Indraprastha Institute of Information Technology</b><br><i>Bachelor of Technology in Computer Science; CGPA: 7.75/10</i> | Delhi, India<br><i>Aug 2013 – Dec 2017</i> |
| • <b>Salwan Public School</b><br><i>12th Std. CBSE; Percentage: 92.3%</i>   | Delhi, India<br><i>Aug 2012 – Aug 2013</i> |
| • <b>Salwan Public School</b><br><i>10th Std. CBSE; GPA: 9.6/10</i>   | Delhi, India<br><i>Aug 2010 – Aug 2011</i> |