Sarthak Grover

Masters in Computer Science

Contact

Phone: +91 79821 30021 / +1 (760) 575-4677
Email: grover.srthk@gmail.com
Email: sgrover@protonmail.ch
LinkdIn: linkedin.com/in/groversarthak/
Github: github.com/shahifaqeer
Web: https://sarthakgrover.github.io/

Interests

Computer Research; Network Measurement and Security; Internet of Things; Data Analysis and Visualization

Education

Princeton University **Jan 2015 – Sep 2017**
M.A. (PhD incomplete), Computer Science

- Advisor: Prof. Nick Feamster
- Transferred from Georgia Institute of Technology **Aug 2012 – Dec 2014**
- GPA: 3.8/4.0

Indian Institute of Technology (IIT) Roorkee, India **Aug 2005 – Dec 2010**
B.Tech, Electronics and Communication Engineering & M.Tech, Wireless Communication

- Dissertation: Performance Evaluation of Wireless Body Area Networks using Cross Layer Approach
- CGPA: 8.062/10.00

Skills and Coursework

Languages: Python, Java, Scala, C/C++, JavaScript

Tools: SBT, Apache Spark, iPython, Pandas, PostgreSQL, PCAP, Wireshark, Docker, Openwrt, Node.js, GNURadio, MATLAB, Octave, NS-2, TinyOS, Xilinx ISE, GPSS

Others: Unix, Adobe Photoshop, Corel Draw, Adobe Flash, Dreamweaver, MS Office, LaTeX

Relevant Courses: Computer Networks, Network Security, Advanced Operating Systems, Machine Learning, Analysis of Algorithms, Software Defined Networks, Neural Networks and AI, Functional Programming

Professional Experience

Business Manager at *Sugandhaa Co.,* New Delhi **Apr 2018 Onwards**

- Managed family owned business. Responsible for inventory, account management, directing sales and delivery. Learned customer interaction and financial management to ensure smooth business operations.
- Completed extra coursework in deep learning and functional programming through Coursera MOOCs.
- **CDN performance analysis:** Designed and implemented a CDN estimation algorithm for websites using xcache, whois data, and DNS information; Tested reachability of top websites; Comparing CDN page-load times with website ASN showed that performance can be improved by moving to different CDNs. [Link]

Graduate Research Assistant at *Department of CS,* Princeton University **Jan 2015 – Sep 2017**

- **IoT fingerprinting and real-time query system:** Analyzed packets of various IoT devices in lab using pcap, extracted relevant features to identify devices and outliers; Simulated user behavior and captured activity periods and background traffic for 10 different IoTs. [Link]
- Developed a filtering algorithm to discard non-IoT traffic at ISP; Transformed network traffic using FFT and PCA, and utilized clustering techniques to successfully fingerprint different IoT devices in lab. Implemented data pipeline in Spark to cluster IoT traffic and detect outlier devices.
- **Security and privacy of the Internet of Things:** Tested multiple IoT devices in lab and exposed security and privacy issues at PrivacyCon 2016; Found that a digital photoframe was susceptible to eavesdroppers and fails to encrypt photographs, and nest thermostat exposed private location information of nearest weather stations to the ISP (now patched); [Link]
- **Broadband traffic analysis:** Analyzed broadband usage patterns of a user group offered higher speed broadband without their knowledge; Found that difference in traffic demand was higher for moderate users as compared to high-volume subscribers; Presented at CableLabs (Jul 2016) and FCC (Oct 2016); [Link]
- **Fog Networks and the Internet of Things:** Teaching Assistant for Coursera MOOC; [Link]

Graduate Research Assistant at *School of CS,* Georgia Tech **Aug 2012 – Dec 2014**

- **Analysis of home network availability, infrastructure, and traffic using BISmark:** Analyzed active and passive network data from multiple homes to study network availability in various countries, popular devices in homes, and traffic usage with time; [Link]
- Found most home traffic is exchanged from a few devices to a small number of popular domains;
- **QoS control using SDN for home networks:** Identified application and programmed appropriate rate shaper based on a set of filtering rules to map traffic to outgoing network flow; [Link]
- **SAZO: Constant guard for home network security:** Used bloom-filters and DPI on home routers to create a blacklist based malware identification and notification system for Comcast; [Link]

- **Analysis of end-to-end routing behavior:** Analyzed traceroute data from access networks to a variety of Internet destinations and examined route persistence and prevalence. Presented talk at AIMS, CAIDA.

Research Scholar at *Department of CS,* NC State University, Raleigh, NC. **Spring 2012**
- Mentor: Prof. Injong Rhee
- Indoor Localization for Samsung Smartphones using Radio: Implemented FM/AM transceiver systems on GNURadio to utilize RDS information for indoor localization;

Junior Research Fellow at *Department of ECE,* IISc Bangalore, India. **Mar 2011 – Dec 2011**
- Mentor: Prof. Anurag Kumar
- *WSNs for Societal Needs and Disaster Management:* Prepared work-plan proposal for submission to the Department of Science and Technology (DST), Govt of India; Computed closed-formed expressions for network reliability, and evaluated information theoretic bounds for random hybrid networks.
- *SmartConnect: DIT-ASTEC WSN Project*: Deployment of industrial wireless sensor networks, project demonstrations and experimental data analysis; Studied tessellation algorithm for WSN drop and placement to ensure end-to-end connectivity in the wild;

Graduate Research Assistant at *Department of ECE,* IIT Roorkee, India **Jan 2010 – Dec 2010**
- **Performance Evaluation of a Wireless Body Area Network:** Implemented cross layer protocol to auto-regressively predict PHY parameters and control MAC level queue for mobile nodes in Rayleigh fading environment. Modeled human body channel for intra BAN (on-body network). Comprehensive simulations on NS2 showed improved network throughput and lifetime. [Link]
- **Implementation of a Soft Decision Decoder using Trellis on FPGA:** Implemented a real-time trellis decoder for BCH codes using VHDL on Xilinx ISE and configured it on FPGA.

Internships

Research Intern at *Comcast,* Philadelphia, PA. **Summer 2016**
- Mentors: Jason Livingood and Nirmal Mody
- Customer Owned and Managed (COAM) Internet of Things (IoT) security: Used DPI to study connectivity, security, and privacy of a subset of Comcast smart homes; Developed script to search for PII in unencrypted IoT data and identified a malfunctioning XBOX in one of the subscribers.

Research Engineer at *Inria,* Paris. **Summer 2014**
- Mentor: Prof. Renata Teixeira
- Home network diagnosis for performance bottleneck detection: Tested uplink and downlink broadband performance from devices to detect if bottleneck is in the local wireless network or at the edge router.

Research Engineer at *Laboratoire dInformatique de Paris 6,* UPMC Paris. **Summer 2013**
- Mentor: Prof. Renata Teixeira
- Home network troubleshooting platform using Fathom and BISmark: Programmed active traceroute test on bismark router and analyzed latency and throughput performance from routers.

Research Intern at *University of New South Wales*, Sydney, Australia. **Summer 2009**
- Mentor: Prof. Vijay Sivaraman
- Wireless Body Area Networks for Athlete Monitoring: Analyzed time-series experimental data collected from wireless bio-medical sensors. Developed encounter based model to capture user mobility, and generate synthetic network topologies.

Selected Publications

S. Grover, R. Ensafi, N. Feamster, "A Case Study of Traffic Demand Response to Broadband Service-Plan Upgrades", *Passive and Active Measurement Conference (PAM)*, March 2016.

S. Grover, N. Feamster, "The Internet of Unpatched Things", *FTC PrivacyCon*, January 2016.

S. Grover, M. Park, S. Sundaresan, S. Burnett, H. Kim, N. Feamster, "Peeking Behind the NAT: An Empirical Study of Home Networks", *ACM SIGCOMM Internet Measurement Conference (IMC)*, October 2013.

Achievements

Awarded **STEM Chateaubriand Fellowship** by the Embassy of France **2015 – 2016**
Awarded **Assistantship in Research** by Princeton University **Jan 2015 – Sep 2017**
Awarded **Assistantship in Research** by Georgia Tech **Aug 2012 – Dec 2014**
Received **Best Student Paper Award** at IEEE WiMob 2010 **Oct 2010**

For more information and details, please visit my website https://sarthakgrover.github.io/