Si Chen

Software Engineer

Davis 301, University at Buffalo, Amherst, NY, US

(716) 335-8052 | schen23@buffalo.edu | www.quake0day.com/about | quake0day | quake0day

Education

Ph.D., Computer Science and Engineering

Buffalo, NY

University at Buffalo - SUNY, GPA 3.8 *Sep. 2012 - May. 2016*

- Research Assistant in Ubiquitous Security and Privacy Research Laboratory (UbiSeC Lab), Advisor: Dr. Kui Ren
- Relevant courses: Operating Systems, Computer Architecture, Multimedia Systems, Computer Vision and Image Processing, High Performance Computing, Algorithms Analysis and Design, Applied Cryptography and Computer Security, Wireless Network Security, Theory of Computation, Modern Network Concept, Wireless Networking and Mobile Computing

M.S., Electrical Engineering

Buffalo, NY

University at Buffalo - SUNY, GPA 3.8 *Sep. 2010 - May. 2012*

- Thesis: "Groundwave Modelling and Online Simulation System for Advanced HF Radio Networking" Advised by Professor Tommaso Melodia
- Relevant courses: Multimedia Wireless Sensor Network, Principle of Information Theory and Coding, Optimization of Wireless Network, Analog Circuits, Biomems & Lab-On-a-Chip, Consumer Optoelectronics

B.S., Measuring & Control Technology and Instrumentations

Beijing, China

China Agricultural University *2006-2010*

- Graduated with Honors, Top 100 Excellent Graduate Theses award
- Relevant courses: Application of MATLAB, C Programming Language, Principles of Microcomputer and Interface Technology, Signal Processing, Sensor and Detecting circuits, Practical Image Processing, Computer Measurement & Control Technology, Principle & Application of Single Chip Microcomputer

Skills

Heavily used	Python, C++, Haskell
Learning	Java, Javascript, Clojure, Perl, Go, Scala
Hacking around	Android, PHP, Tcl/tk, OCaml
OS	Heavy Arch and Gentoo Linux user with insight into Linux kernel
Authoring	Vim, LaTeX
Web	Django, Web.py, Meteor (Javascript), Snap (Haskell), HTML5, WebGL, jQuery, CSS(Bootstrap UI)

Projects

AcousAuth: An acoustic-based mobile application for user authentication

Project Leader

This project aims at developing a **highly secure alternative NFC system**. *Jan. 2013 - Aug. 2013*

- **GitHub: https://github.com/quake0day/Jigglypuff Vimeo: http://vimeo.com/77708077**
- **Techniques: Python, C++, Android, jQuery, HTML5, Web.py, Django, MySQL, CSS(Bootstrap UI)**
- Proposed an alternative NFC technique which provides NFC-like functionalities commercial smartphone applications, and enables much stronger security guarantees but requires less strict hardware support.
- Designed a smartphone empowered system for personal authentication featuring a seamless, faster, easier and safer authentication process without the need of special infrastructure.
- Shortlisted in the 19th Annual International Conference on Mobile Computing and Networking (ACM Mobicom'13) App Competition **(Top 10)**.

IndoorCrowd: Mapping of indoor building structures through mobile devices

Project Leader

Jun. 2013 - Feb. 2015

This project is **the first to propose, design and implement** a smartphone-based crowdsourcing system that explores the power of untrained individuals to generate building interior views at scale.

- **GitHub: https://github.com/quake0day/Dragonite**
- **Techniques: Python, Spark, Android, C++ (OpenCV), Web.py, jQuery, Matlab, MySQL, WebGL, CSS(Bootstrap UI)**
- Proposed a low-cost crowdsource-based method to reconstruct indoor floor plan that by utilizing sensor-rich video data from mobile users.
- Innovatively exploited the sequential relationship between consecutive frames to improve system performance.
- Achieved a significant improvement of accuracy compared with other indoor scene reconstruction systems, according to a long-term real-world experiment on 30 volunteers.
- Served as an important stepping stone towards economically-viable massive indoor 3D model reconstruction.

FreeTrack: Tracking mobile social network users

Core Member

Jan. 2013 - May. 2013

This project serves as a **critical security reminder** of the current location based social networks (LBSNs) pertaining to a vast number of users.

- **GitHub: https://github.com/kkspeed/FreeTrack**
- **Techniques: Clojure, Android (App Dev, Disassembly with Smali, MonkeyRunner)**
- Identified severe location privacy leaks from popular location based social networks (e.g. Momo, Skout and Wechat) that allows non-priviledged attacker to effectively pinpoint users' locations and even performed long-term tracking to reveal identity.
- Developed an automated user location tracking system and tested it on the these LBSNs.
- Demonstrated its effectiveness and efficiency via a 3-week real-world experiment with 30 volunteers.
- The evaluation results showed that this system can geo-locate a target with high accuracy and can readily recover users' Top 5 locations.
- Proposed using grid reference system and location classification to mitigate the attacks.

Ground Wave Simulator

Project Leader

Jan. 2012 - Jan. 2013

The aim of this project is to **accomplish an online simulation system based on NS-2** network simulator to simulate advanced high frequency (HF) network.

- **GitHub:** Front-end **https://github.com/quake0day/Torterra**, Backend **https://github.com/quake0day/Groudon**
- **Techniques: Python, C++, Perl(Catalyst, DBIx), Tcl/Tk, MySQL, HTML, CSS(Bootstrap UI)**
- Studied models of HF channel characteristics, waveforms, protocols, and typical traffic loads.
- Designed an online simulation system to calculate the electric field strength and basic path loss in the real-world environment.
- Implemented an online ground wave simulation system based on NS-2 open source network simulator, GRWAVE and VOACAP Software to simulate advanced high frequency (HF) network.

Intellectualized Greenhouse Measuring & Control System

Project Leader

May. 2009 - May. 2010

This project aims at **developing a greenhouse management system** using wireless sensor network.

- **Techniques: Python, C, Python, PHP, MySQL, Javascript**
- Designed a mathematical model specialized for simulating greenhouse environment.
- Used CC2430 wireless node and Zigbee stack (Z-stack) to measure and control a greenhouse model's humidity and temperature.
- Used Python, PHP, Javascript (jQuery), MySQL and C to create a realtime B/S System.
- Designed a PCB with controllers that can use CC2430 with computer to remote control the greenhouse model.
- Implemented PHP reflection mechanism to create a plugin system for further system enhancement.

Internships

Sina Corp.

Application Dev Engineer

Apr. 2010 - July. 2010

Search Engine Group

- **Techniques: Python, C, Javascript(jQuery), PHP, CSS**
- **Scale: Approximately 12300 lines of code by myself within 3 months.**
- Used Python (Matplotlib), Javascript (jQuery) and PHP with MySQL to build an UNIX cluster administration system
- Designed and implemented an algorithm to calculate daily hottest words from Weibo (Chinese twitter) search log in Python
- Created an usage frequency indicator to show Weibo's current usage frequency in different areas using Python, C, PHP with MySQL, Javascript

ASSE/WH China

Web Developer & Administrator

Oct. 2007- Feb. 2008

Front-end Group

- **Techniques: PHP, Javascript**
- **Scale: Approximately 10700 lines of code by myself within 4 months.**
- Re-constructed company's website using Wordpress CMS System
- Built an online registration system using PHP and MySQL

Extracurricular Activity

2013	**Used Python to create a program to increase Weibo followers automatically**
2012	**Used SigOps uBoot System (UIUC), C, Assembly to create my own operating system 'Quake'**
2010	**Used Python, jQuery, PHP to build an on-line GPA Calculate System**
2010	**Used Python, C++, Sed, PHP and Javascript to design an Automatic Tests Score SMS Notifier**
2010	**Co-founder and technique advisor of the Future Engineers Association (FEA)**
2009	**Used CC2430 microcomputer and TinyOS embedded system, PHP, C, Shell Script to create an Amphibian & Reptiles Aquarium Monitoring System**
2008	**Used Google Map API, Javascript, HTML to design an on-line alumni catalog**

Honors & Awards

2015	**Finalist**, Student Travel Grant Awards, IEEE ICDCS Conference 2015	*Columbus, OH*
2013	**Finalist**, The 19th Annual International Conference on Mobile Computing and Networking (ACM Mobicom'13) App Competition	*Orlando, FL*
2010	**Finalist**, Excellent Graduate Award in China Agricultural University	*Beijing, China*
2010	**Finalist**, Top 100 Excellent Graduate Theses in China Agricultural University	*Beijing, China*
2009	**Finalist**, National University Student Innovation Program Award,	*Beijing, China*
2009	**3rd Award**, International Interdisciplinary Contest in Modeling (ICM)	*Beijing, China*
2009	**1st Award**, Scholarship for Excellent Academic Performance	*Beijing, China*
2008	**3rd Award**, Scholarship for Excellent Academic Performance	*Beijing, China*
2007	**3rd Award**, Scholarship for Excellent Academic Performance	*Beijing, China*
2006	**1st Place**, "The best debater" title in debate competitions	*Beijing, China*

Publications

- **Si Chen**, Muyuan Li, Kui Ren, Xinwen Fu, Chunming Qiao, *"Rise of the Indoor Crowd: Reconstruction of Building Interior View via Mobile Crowdsourcing,"* in **Proceedings of the 13th ACM Conference on Embedded Networked Sensor Systems (SenSys),** 2015.
- **Si Chen**, Muyuan Li, Kui Ren, Chunming Qiao, *"CrowdMap: Accurate Reconstruction of Indoor Floor Plan from Crowdsourced Sensor-Rich Videos,"* in **Proceedings of the 35th IEEE International Conference on Distributed Computing Systems (ICDCS),** 2015.
- Muyuan Li, Haojin Zhu, Zhaoyu Gao, **Si Chen**, Le Yu, Shangqian Hu, Kui Ren ,*"All your location are belong to us: Breaking mobile social networks for automated user location tracking,"* in **Proceedings of the 15th ACM international symposium on Mobile ad hoc networking and computing (Mobihoc),** 2014.
- Bingsheng Zhang, Qin Zhan, **Si Chen**, Muyuan Li, Kui Ren, Cong Wang, Di Ma, *"PriWhisper: Enabling Keyless Secure Acoustic Communication for Smartphones,"* in **IEEE Internet of Things Journal,** 2014.
- Eric Koski, **Si Chen**, Scott Pudlewski, Tommaso Melodia, *"Network simulation for advanced HF communications engineering,"* in **Proceedings of the 12th International Conference on Ionospheric Radio Systems and Techniques (IRST),** 2012.
- **Si Chen**, Lina Ling, Yuan Rongchang, Longqing Sun, *"Classification Model of Seed Cotton Grade Based on Least Square Support Vector Machine Regression Method,"* in **Proceedings of the 6th IEEE International Conference on Information and Automation for Sustainability (ICIAfS),** 2012.
- Rongchang Yuan, Zhengjiang Li, Si Chen, *"Movement and deformation of virtual object based on argument passing method,"* in **Proceedings of the IEEE International Conference on Virtual Environments, Human-Computer Interfaces and Measurement Systems (VECIMS'12),** 2012.
- Rongchang Yuan, Si Chen, Zhengjiang Li, Shengrong Lu, Li Wang, Haigan Yuan, *"Simulation and Models on Control of Pests with Ozone in Greenhouses Plant,"* in **Proceedings of the IASTED International Conference on Modelling, Simulation, and Identification (MSI'2011),** 2011.
- Rongchang Yuan, HaiganYuan, Si Chen, Longqing Sun, Feng Qin, Han Zhang, Yukun Zhu, Daokun Ma, *"Research on the k-coverage local wireless network and its communication coordination mechanism design,"* in **Proceedings of the 5th International Conference on Computer and Computing Technologies in Agriculture (CCTA 2011)**, 2011