

JUN HAN

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ACADEMIC APPOINTMENT

National University of Singapore

Assistant Professor
Computer Science, School of Computing

July 2018 - Present

EDUCATION

Carnegie Mellon University, Moffett Field, CA

Ph.D., Electrical and Computer Engineering

Sep 2010 - May 2018

Dissertation: *Advantages and Risks of Sensing for Cyber-Physical Security*

Thesis Committee: Patrick Tague (Advisor), Anupam Datta, Pei Zhang, and Marco Gruteser

Carnegie Mellon University, Pittsburgh, PA

M.S., Electrical and Computer Engineering

May 2007

B.S., Electrical and Computer Engineering

May 2006

RESEARCH INTERESTS

Interests: **Sensing and Security of Internet-of-Things and Cyber-Physical Systems**

My research interest lies at the intersection of *sensing systems* and *security*, and focuses on utilizing contextual information for security applications in the Internet-of-Things and Cyber-Physical Systems. Specifically, my research focuses on enabling cross-platform devices (dissimilar in hardware, vendor, and/or sensor types) to *verify* relative physical properties and subsequently *coordinate* across verified devices, hence enabling novel methods of sensor fusion for new security applications.

HONORS AND AWARDS

- **Audience Choice Award** *Nov 2017*
 - ACM Conference on Systems for Energy-Efficient Built Environments (*BuildSys'17*)
- **Best Poster Runner-up Award** *Feb 2017*
 - ACM Workshop on Mobile Computing Systems and Applications (*HotMobile'17*)
- **NSF CPS Breakthrough, \$450,000** (Assisted Dr. Patrick Tague) *Sep 2016*
 - “*Multi-Sensory Event Detection for Cross-Platform Coordination and Verification*”
- **Ann and Martin McGuinn Graduate Fellowship** *Aug 2015 - May 2016*
 - *Carnegie Institute of Technology, Carnegie Mellon University*
- **Best Poster Award** *May 2012*
 - Intel Science & Technology Center for Secure Computing (ISTC): Secure Computing Research for Users' Benefit (SCRUB) Summer Retreat
- **Frank J. Marshall Graduate Fellowship** *Aug 2011 - May 2012*
 - *Carnegie Institute of Technology, Carnegie Mellon University*

- **Dean's Scholarship** *Aug 2010 - May 2011*
 - *Carnegie Institute of Technology, Carnegie Mellon University*
- **Dean's List** *Aug 2005 - May 2006*
 - *Carnegie Institute of Technology, Carnegie Mellon University*

PROFESSIONAL EXPERIENCE

- Carnegie Mellon University**, Moffett Field, CA *Jan 2015 - May 2018*
 Graduate Research Assistant, CyLab and Electrical and Computer Engineering
- Swiss Federal Institute of Technology (ETH)**, Zurich, Switzerland *Jul 2013 - Oct 2014*
 Visiting Ph.D. Student (Academic Guest), Department of Computer Science
- Carnegie Mellon University**, Pittsburgh, PA *Sep 2010 - Jun 2013*
 Graduate Research Assistant, CyLab and Electrical and Computer Engineering
- Samsung Electronics**, Suwon, Korea *Jul 2007 - Aug 2010*
 Software Engineer, Digital Media and Communications Business
- Bosch Corporation**, Pittsburgh, PA *Jun 2006 - Dec 2006*
 Research Intern, Research and Technology Center

PUBLICATIONS

Journal, Conference, and Workshop Papers (Listed in reverse chronological order)

- *Published in top-tier **sensing systems** conference and journals: **IPSN**, **TOSN***
 - *Published in top-tier **security** conferences: **S&P (Oakland)**, **CCS***
- [1] Nitya Lakshmanan, Inkyu Bang, Min Suk Kang, **Jun Han**, Jong Taek Lee,, “SurFi: Detecting Surveillance Camera Looping Attacks with Wi-Fi Channel State Information”. To appear in the Proceedings of *12th ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec)*., Miami, FL, 2019.
 Acceptance Rate: 32.2% (29 of 90)
 - [2] **Jun Han**, Shijia Pan, Manal Kumar Sinha, Hae Young Noh, Pei Zhang and Patrick Tague, “Smart Home Occupant Identification via Sensor Fusion Across On-Object Devices”. *ACM Transactions on Sensor Networks (TOSN)*, Volume 14 Issues 3-4, Article No. 23, Dec. 2018.
 - [3] **Jun Han**, Albert Jin Chung, Manal Kumar Sinha, Madhumitha Harishankar, Shijia Pan, Hae Young Noh, Pei Zhang and Patrick Tague, “Do You Feel What I Hear? Enabling Autonomous IoT Device Pairing using Different Sensor Types”. In *Proceedings of the 39th IEEE Symposium on Security and Privacy (Oakland)*, San Francisco, 2018.
 Acceptance Rate: 11.5% (63 of 549 / [See submission and decision statistics](#))
 - [4] Shijia Pan, Carlos Ruiz, **Jun Han**, Adeola Bannis, Patrick Tague, Hae Young Noh, and Pei Zhang, “UniverSense: IoT Device Pairing Using Heterogeneous Sensing Signals”. In Proceedings of *ACM International Workshop on Mobile Computing Systems and Applications (HotMobile)*, Tempe, Arizona, February 2018.
 Acceptance Rate: 29.2% (19 of 65).

- [5] Xinlei Chen, Aveek Purohit, Shijia Pan, Carlos Ruiz, **Jun Han**, Zheng Sun, Frank Mokaya, Patrick Tague and Pei Zhang, “Design Experiences in Minimalistic Flying Sensor Node Platform through SensorFly”. *ACM Transactions on Sensor Networks (TOSN)*, Volume 13 Issue 43, December 2017.
- [6] **Jun Han**, Shijia Pan, Manal Kumar Sinha, Hae Young Noh, Pei Zhang and Patrick Tague, “SenseTribute: Smart Home Occupant Identification via Fusion Across On-Object Sensing Devices”. In *Proceedings of ACM International Conference on Systems for Energy-Efficient Built Environments (BuildSys)*, Delft, The Netherlands, November 2017.
Acceptance Rate: 31.3% (30 of 96). **AUDIENCE CHOICE AWARD**
- [7] **Jun Han**, Albert Jin Chung, and Patrick Tague, “PitchIn: Eavesdropping via Intelligible Speech Reconstruction using Non-Acoustic Sensor Fusion”. In *Proceedings of ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN)*, Pittsburgh, PA, April 2017.
Acceptance Rate: 18.3% (19 of 104). [Project Website](#)
- [8] **Jun Han**, Madhumitha Harishankar, Xiao Wang, Albert Jin Chung, and Patrick Tague, “Convoy: Physical Context Verification for Vehicle Platoon Admission”. In *Proceedings of ACM International Workshop on Mobile Computing Systems and Applications (HotMobile)*, Sonoma, CA, February 2017.
Acceptance Rate: 36% (18 of 50).
- [9] Taeho Lee, Christos Pappas, Cristina Basescu, **Jun Han**, Torsten Hoeffler, Adrian Perrig, “Source-Based Path Selection: The Data Plane Perspective”. In *Proceedings of ACM Conference on Future Internet Technologies (CFI)*, Seoul, Korea, June 2015.
- [10] **Jun Han**, Yue-Hsun Lin, Adrian Perrig, and Fan Bai, “MVSec: Secure and Easy-to-Use Pairing of Mobile Devices with Vehicles (Short Paper)”. In *Proceedings of ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec)*, Oxford, U.K., July 2014.
Acceptance Rate: 26.0% (25 of 96).
- [11] Zongwei Zhou, **Jun Han**, Yue-Hsun Lin, Adrian Perrig, and Virgil Gligor, “KISS: Key it Simple and Secure Corporate Key Management”. In *Proceedings of International Conference on Trust and Trustworthy Computing (TRUST)*, London, U.K., June 2013.
Acceptance Rate: 20.5% (8 of 39).
- [12] Tiffany Hyun-Jin Kim, Payas Gupta, **Jun Han**, Emmanuel Owusu, Jason Hong, Adrian Perrig, Debin Gao, “OTO: Online Trust Oracle for User-Centric Trust Establishment”. In *Proceedings of ACM Conference on Computer and Communications Security (CCS)*, Raleigh, NC, October 2012.
Acceptance Rate: 18.9% (80 of 423).
- [13] Lorenzo Martignoni, Pongsin Poosankam, Matei Zaharia, **Jun Han**, Stephen McCamant, Dawn Song, Vern Paxson, Adrian Perrig, Scott Shenker, Ion Stoica, “Cloud Terminal: Secure Access to Sensitive Applications from Untrusted Systems”. In *Proceedings of the USENIX Annual Technical Conference (Usenix ATC)*, Boston, MA, June 2012.
Acceptance Rate: 18.4% (43 of 234).
- [14] Emmanuel Owusu, **Jun Han**, Sauvik Das, Adrian Perrig, and Joy Zhang, “ACcEssory: Keystroke Inference using Accelerometers on Smartphones”. In *Proceedings of ACM International Workshop on Mobile Computing Systems and Applications (HotMobile)*, San Diego, CA, February 2012.
Acceptance Rate: 20.6% (14 of 68).
- [15] **Jun Han**, Emmanuel Owusu, Thanh-Le Nguyen, Adrian Perrig, and Joy Zhang, “ACComplice: Location Inference using Accelerometers on Smartphones”. In *Proceedings of IEEE International Conference on Communication Systems and Networks (COMSNETS)*, Bangalore, India, January

2012.

Acceptance Rate: 27.4% (46 of 168).

- [16] **Jun Han**, Abhishek Jain, Mark Luk, and Adrian Perrig, “Don’t Sweat Your Privacy: Using Humidity to Detect Human Presence”. In *Proceedings of Workshop On UbiComp Privacy - Technologies, Users, Policy (UbiPriv)*, Innsbruck, Austria, September 2007.
- [17] Soundararajan Srinivasan, **Jun Han**, Dhananjay Lal, and Aca Gacic, “Towards Automatic Detection of Falls Using Wireless Sensors”
In *Proceedings of Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Lyon, France, August 2007.

POSTERS AND DEMOS

- [1] **Jun Han**, Madhumitha Harishankar, Xiao Wang, Albert Jin Chung, and Patrick Tague, “Poster: Convoy: Physical Context Verification for Vehicle Platoon Admission”, *International Workshop on Mobile Computing Systems and Applications (HotMobile)*, February 2017. **BEST POSTER RUNNER-UP AWARD**
- [2] **Jun Han**, Emmanuel Owusu, Thanh-Le Nguyen, Adrian Perrig, and Joy Zhang, “Poster: AC-Complice - Location Inference using Accelerometers on Smartphones”, *Intel Science & Technology Center for Secure Computing (SCRUB) Summer Retreat*, May, 2012. **BEST POSTER AWARD**
- [3] **Jun Han**, Jae Yoon Chong, and Sukun Kim, “Demo Abstract: SNORES - Towards a Less Intrusive Home Sleep Monitoring System Using Wireless Sensor Networks”, *ACM Conference on Embedded Networked Sensor Systems (SenSys)*, November, 2009.

TECHNICAL REPORT

- [1] **Jun Han**, Yue-Hsun Lin, Adrian Perrig, and Fan Bai, “MVSec: secure and easy-to-use pairing of mobile devices with vehicles”, *CyLab, Technical Report CMU-CyLab-14-006*, 2014.

PATENT

- [1] Yu Seung Kim, **Jun Han**, and Patrick Tague, “Inter-Vehicle Authentication Using Visual Contextual Information”, US20170132477 A1

TALKS

Do You Feel What I Hear? Enabling Autonomous IoT Device Pairing using Different Sensor Types

Presented at the 39th IEEE S&P (Oakland 2018), [Video](#) *San Francisco, CA, May 2018*

SenseTribute: Smart Home Occupant Identification via Fusion Across On-Object Sensing Devices

Presented at the 4th ACM BuildSys *Delft, The Netherlands, Nov 2017*

PitchIn: Eavesdropping via Intelligible Speech Reconstruction using Non-Acoustic Sensor Fusion

Presented at the 16th ACM/IEEE ISPN *Pittsburgh, PA, Apr 2017*

Convoy: Physical Context Verification for Vehicle Platoon Admission

Presented at the 18th ACM HotMobile *Sonoma, CA, Feb 2017*

MVSec: Secure and Easy-to-Use Pairing of Mobile Devices with Vehicles

Presented at the 7th ACM Wisec *Oxford, UK, Jul 2014*

ACComplICE: Location Inference using Accelerometers on Smartphones

Invited talk at Kookmin University *Seoul, Korea, Jun 2013*
Invited talk at Seoul National University *Seoul, Korea, Jan 2013*
Invited talk at Korea University *Seoul, Korea, Dec 2012*
Intel ISTC SCRUB Summer Retreat *Half Moon Bay, CA, May 2012*
Presented at the 4th IEEE COMSNETS *Bangalore, India, Jan 2012*

TEACHING EXPERIENCE

Topics in Computer Science: Internet-of-Things Security (CS6282) *Spring 2019*
Computer Science, National University of Singapore, Singapore

Lab Rotation: Network and IoT Security (CS6101) *Spring 2019, Fall 2018*
Computer Science, National University of Singapore, Singapore

INI MSIT Project Practicum (14-798) *Fall 2015, Fall 2016, Fall 2017*
Project Sponsor/Mentor
Information Networking Institute, Carnegie Mellon University, Moffett Field, CA

Mobile and Pervasive Computing (18-843) *Spring 2017*
Course Project Mentor
Electrical and Computer Engineering, Carnegie Mellon University, Moffett Field, CA

Wireless Network Security (18-637) *Spring 2016*
Course Project Mentor
Electrical and Computer Engineering, Carnegie Mellon University, Moffett Field, CA

Mobile Security (18-638) *Fall 2015*
Course Project Mentor
Electrical and Computer Engineering, Carnegie Mellon University, Moffett Field, CA

Operating Systems and Networks (252-0062-00L) *Spring 2014*
Teaching Assistant
Computer Science, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland

Introduction to Programming (252-0021) *Fall 2013*
Teaching Assistant
Computer Science, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland

Network Security (18-731) *Fall 2012*
Teaching Assistant
Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA

Embedded System Design (18-549) *Spring 2007*
Teaching Assistant
Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA

PROFESSIONAL ACTIVITIES

Journal Reviewer

ACM Transactions on Privacy and Security (TOPS)
ACM Transactions on Sensor Networks (TOSN)
ACM Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)
ACM Transactions on Embedded Computing Systems (TECS)
IEEE Transactions on Mobile Computing (TMC)

IEEE Transactions on Multi-Scale Computing Systems (TMSCS)
IEEE IEEE Transactions on Vehicular Technology (TVT)
Journal of Computer and System Sciences (JCSS)

Program Committee

IEEE International Conference on Communication Systems & Networks (COMSNETS), 2020
ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys), 2019
ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec), 2019
(Extended Review Committee) ACM International Conference on Mobile Systems, Applications, and Services (MobiSys), 2019
ACM Workshop on the Internet of Safe Things (SafeThings), 2019
Ubicomp Workshop on Combining Physical and Data-Driven Knowledge in Ubiquitous Computing (CPD), 2018
(Poster/Demo PC) IEEE Vehicular Networking Conference (VNC), 2018

External Reviewer

IEEE Conference on Communications and Network Security (CNS),	<i>2015 - 2016, 2018</i>
IEEE Conference on Computer Communications (Infocom)	<i>2016 - 2017</i>
ACM Asia Conference on Computer and Communications Security (AsiaCCS)	<i>2016 - 2017</i>
ACM Conference on Security and Privacy in Wireless and Mobile NW (WiSec)	<i>2015 - 2016</i>
Annual Computer Security Applications Conference (ACSAC)	<i>2015</i>
ACM Special Interest Group on Data Communication (SIGCOMM)	<i>2014</i>
IEEE Conference on Sensing, Communication, and Networking (SECON)	<i>2013 - 2014</i>
IEEE International Conference on Smart Homes and Health Telematics (iCOST),	<i>2011</i>

Conference Organization Committee

Poster/Demo Chair, ACM International Conference on Systems for Energy-Efficient Built Environments, Cities, and Transportation (BuildSys), 2019
Web Chair, ACM International Conference on Mobile Systems, Applications, and Services (MobiSys), 2019