Welcome Message

On behalf of the organizing, program, and steering committees, it is a tremendous pleasure to welcome you to the 2016 IEEE Asian Hardware Oriented Security and Trust Symposium (AsianHOST) at The Evergreen Resort Hotel in Yilan, Taiwan. This year represents the first time that AsianHOST symposium has ever been held. We chose Taiwan for the first event due in part to the strong semiconductor industry in this area.

The AsianHOST will be a premier event in hardware security encompassing all aspects of research and development in this area of growing significance, especially for Asia and Pacific areas. Attendance at AsianHOST includes strong representation from the embedded systems community, the microprocessor community, the application-specific integrated circuit (ASIC) design community, the Field Programmable Gate Array (FPGA) community, the Internet of Things (IoT) community, and the ASIC test community. Attendees represent academic, industrial, and government organizations.

We are grateful for our sponsors, including the IEEE, IEEE Computer Society, IEEE Test Technology Technical Council, Raith America, Huawei, and Ministry of Science and Technology in Taiwan.

The paper submission of AsianHOST 2016 employed a two-step procedure, where each submission first registered the abstract and subsequently submitted the full manuscript. Thanks to the tremendous efforts of the organizing and technical program committee (TPC) members, we were able to attract a large number of submissions for the first edition of AsianHOST! We received 51 abstracts. Of those registered abstracts, we received 47 full manuscripts. Submissions were from 12 countries across the world with the majority from USA, China, India, and Japan. At least four reviewers were assigned to each manuscript using the automatic assignment process in EasyChair (https://www.easychair.org/), which considered conflict of interests (COIs) for the TPC members as well as the reviewers' stated preferences. All papers have at least three reviews with 75% of them getting four or more reviews. After all the reviews were collected, a one-week online discussion was conducted for all the papers. Then the paper ranking and suggested decision were made accessible to all TPC members for the final round of discussion. We were able to reach consensus decisions on the acceptance of 24 papers for oral presentations in the technical program, giving us a 51% acceptance rate. We thank all the TPC members for their outstanding efforts and dedication in creating a high-quality technical program in AsianHOST 2016.

This AsianHOST 2016 technical program spans for 2 days. The program includes 24 oral presentations and a student poster session (note that student posters are not included in the proceedings). The invited speakers for HOST showcase some of the most innovative thinkers in the world in hardware security. Our keynote speakers include Tim Cheng (HKUST), Mark Tehranipoor (U. of Florida), Tsutomu Matsumoto (Yokohama National U.), Masanori Hashimoto (Osaka U.), Shih-Lien Lu (TSMC), and Yousef Iskander (CISCO). The program also features an industrial panel entitled, “Hardware Security in Semiconductor Industry”. The panelists include prominent speakers from industry, academia, as well as government.
Finally, we would like to sincerely thank all the members of the organizing committee, the technical program committee, and the steering committee for their outstanding efforts to ensure the introduction of the AsianHOST 2016. Special thanks to our finance chair and one of the co-founders, Gang Qu (U. of Maryland), for his hard-working in balancing the budget and working with the general and TPC chairs on all aspects of the conference. Finally, we would like to acknowledge Poetry-Life Professional Conference Organizer for their professional services and supports in securing the venue for AsianHOST 2016.

General Chair
Swarup Bhunia
University of Florida

General Co-Chair
Tsung-Yi Ho
National Tsing Hua University

Program Chair
Yier Jin
University of Central Florida

Vice-program Chair
Ozgur Sinanoglu
New York University Abu Dhabi
## Committees

### Organizing Committee

**General Chair**
S. Bhunia, U. of Florida

**General Co-Chair**
T-Y. Ho, National Tsing Hua U.

**Program Chair**
Y. Jin, U. of Central Florida

**Vice-program Chair**
O. Sinanoglu, NYU Abu Dhabi

**Finance Chair**
G. Qu, U. of Maryland

**Publicity Chair**
D. Forte, U. of Florida

- R. Chakraborty, IIT Kharagpur
- S. Narasimhan, Intel

**Local Arrangements Chair**
C-M. Cheng, National Taiwan U.

- Y-Y. Liu, Yuan Ze U.

**Registration Chair**
C-Y. Lee, National Tsing Hua U.

**Panel Chair**
S. Fazzari, DARPA

- Y. Liu, Tsinghua U.

**Industrial Liaison**
M. Tehranipoor, U. of Florida

**Publications Chair**
C-H. Chang, Nanyang Technological U.
Steering Committee

M. Tehranipoor, U. of Florida (Chair)  
O. Sinanoglu, NYU Abu Dhabi  
Y. Jin, U. of Central Florida  
T-Y. Ho, National Tsinghua U.  
S. Bhunia, U. of Florida  
H. Yang, Tsinghua U.  
F. Koushanfar, UCSD  
J. Plusquellec, UNM  
G. Qu, U. of Maryland

Co-Founders

Y. Jin, U. of Central Florida  
M. Tehranipoor, U. of Florida  
S. Bhunia, U. of Florida  
G. Qu, U. of Maryland

Technical Committee

Chip-Hong Chang  
Massimo Alioto  
Sergei Skorobogatov  
Ilia Polian  
Uli Ruhrmair  
Ingrid Verbauwhede  
Said Hamdioui  
Giorgio Di Natale  
Xiaoxiao Wang  
Huazhong Yang  
Qingxu Deng  
Xiaowei Li  
Huawei Li  
Yongpan Liu  
Jia Di  
Qiang Xu  
Tsung-Yi Ho  
Tsung-Te Liu  
Hsie-Chia Chang  
Rajat Chakraborty  
Debdeep Mukhopadhyay  
Susmita Sur-Kolay  
Kim Tae Hyoung  
Makoto Nagata  
Kazuo Sakiyama  
Jongsun Park  
Yongdae Kim  
Ozgur Sinanoglu  
Mark Tehranipoor  
Swarup Bhunipoor  
Domenic Forte  
Gang Qu  
Yier Jin  
Qiaoyan Yu  
Sandip Ray  
Seetharam Narasimhan  
Jim Plusquellec  
Farinaz Koushanfar  
Lejla Batina  
Ali Jahanian  
Siavash Bayat-Sarmadi  
Takashi Sato  
Sying-Jyan Wang  
Michail Maniatakos
AsianHOST 2016 Program Highlights

- 5 Featured Invited Speakers showcasing some of the world’s leading innovative thinkers in hardware security! It includes 2 Keynote Talks, 4 Invited Talks.
- 24 Technical Papers
- One panel on industrial view towards hardware security
- One sponsored industrial talk
- Student poster session
- The first international hardware security forum in Asia

Monday, December 19, 2016

7:15 - 8:15AM  Registration

SESSION 1: PLENARY SESSION
Moderator: Gang Qu, University of Maryland

8:15 - 8:30AM  Welcome Remarks: AsianHOST 2016 General and Program Chairs

8:30 - 9:15AM  KEYNOTE I
Speaker: Tim Cheng, Dean of Engineering, Hong Kong University of Science and Technology
Title: Security Threats in Hardware Design’s Unspecified Functionality

9:15 - 9:50AM  INVITED TALK
Speaker: Tsutomu Matsumoto, Yokohama National University
Title: Nano Artifact Metrics using Silicon Random Nanostructures

9:50 - 10:20AM  BREAK
10:20 - 12:00PM SESSION 2: PUF DESIGN AND APPLICATIONS
Session Chair: Qiaoyan Yu, University of New Hampshire

- **Upper Bounds on The Min-Entropy of RO Sum, Arbiter, Feed-Forward Arbiter, and S-ArbRO PUFs**
  Jeroen Delvaux - KU Leuven and Shanghai Jiao Tong U.
  Dawu Gu - Shanghai Jiao Tong U.
  Ingrid Verbauwhede - KU Leuven and iMinds

- **A New Event-driven Dynamic Vision Sensor based Physical Unclonable Function for Camera Authentication in Reactive Monitoring System**
  Yue Zheng, Yuan Cao, and Chip-Hong Chang - Nanyang Technological U.

- **Enhancing Noise Sensitivity of Embedded SRAMs for Robust True Random Number Generation in SoCs**
  M. Tauhidur Rahman, Domenic Forte, and Mark Tehranipoor - U. of Florida
  Xiaoxiao Wang - Beihang U.

- **RPUF: Physical Unclonable Function with Randomized Challenge to Resist Modeling Attack**
  Jing Ye, Yu Hu, and Xiaowei Li - Chinese Academy of Sciences

- **An Ultra-low Overhead LUT-based PUF for FPGA**
  Jiadong Wang, Aijiao Cui, Mengyang Li - Harbin Institute of Technology, Shenzhen Graduate School
  Gang Qu - U. of Maryland
  Huawei Li - Chinese Academy of Sciences

12:00 - 1:20PM LUNCH

12:00 - 5:00PM POSTER SESSION (Note: in parallel with technical sessions)

12:30 - 12:50PM Lunch Talk
Speaker: Jason Sanabia, Raith America
Title: **Perfecting Large Area, High Resolution SEM Imaging with 3D-Stitching for Integrated Circuit Reverse Engineering**
1:20 - 1:50PM SESSION 3: INVITED TALK
Session Chair: Tsung-Yi Ho, National Tsing Hua University
Speaker: Masanori Hashimoto, Osaka University
Title: Oscillator-based True Random Number Generator Robust to Process and Environmental Variation

1:50 - 3:30PM SESSION 4: EMERGING HARDWARE SECURITY TOPICS
Session Chair: Shu-Min Li, National Sun Yat-sen University

- **Echeloned IJTAG Data Protection**
  Senwen Kan - AMD
  Jennifer Dworak and James George Dunham - Southern Methodist U.

- **Sneak Path Enabled Authentication for Memristive Crossbar Memories**
  Md. Badruddoja Majumder, Mesbah Uddin, and Garrett Rose - U. of Tennessee
  Jeyavijayan Rajendran - U. of Texas at Dallas

- **Transistor-Level Camouflaged Logic Locking Method for Monolithic 3D IC Security**
  Jaya Dofe and Qiaoyan Yu - U. of New Hampshire
  Chen Yan, Scott Kontak, Emre Salman - Stony Brook U.

- **How Secure is Split Manufacturing in Preventing Hardware Trojan?**
  Zhang Chen, Pingqiang Zhou - ShanghaiTech U.
  Tsung-Yi Ho - National Tsing Hua U.
  Yier Jin - U. of Central Florida

- **Using Image Sensor PUF as Root of Trust for Birthmarking of Perceptual Image Hash**
  Yuan Cao – Hohai U.
  Le Zhang and Chip-Hong Chang - Nanyang Technological U.

3:30 - 3:50PM BREAK
SESSION 5: HARDWARE PLATFORM ATTACK AND DEFENSE

Session Chair: Chip Hong Chang, Nanyang Technological University

- *Aging Attacks for Key Extraction on Permutation-Based Obfuscation*
  Zimu Guo, Mark Tehranipoor, and Domenic Forte - U. of Florida

- *Defeating Drone Jamming With Hardware Sandboxing*
  Joshua Mead, Christophe Bobda, and Taylor Whitaker - U. of Arkansas

- *A New Approach for Root-Causing Attacks on Digital Microfluidic Devices*
  Pushpita Roy and Ansuman Banerjee - Indian Statistical Institute

- *Inner Collisions in ECC: Vulnerabilities of Complete Addition Formulas for NIST Curves*
  Poulami Das, Debapriya Basu Roy, Harishma Boyapally, and Debdeep Mukhopadhyay - IIT Kharagpur

- *Error Detection Reliable Architectures of Camellia Block Cipher Applicable to Different Variants of its Substitution Boxes*
  Mehran Mozaffari Kermani - Rochester Institute of Technology
  Reza Azarderakhsh – Florida Atlantic U.
  Jiafeng Xie - Wright State U.

DINNER (Evergreen Resort Hotel)

Tuesday, December 20, 2016

SESSION 6: PLENARY SESSION

Moderator: Yier Jin, University of Central Florida

KEYNOTE II

Speaker: Mark Tehranipoor, University of Florida
Title: *Security Rule Check: A New Automated Test for Security*
9:15 - 9:50AM  INVITED TALK
Speaker: Shih-Lien Lu, TSMC
Title: Hardware Security: A Foundry Perspective

9:50 - 10:20AM  BREAK

10:20AM - 12:00PM  SESSION 7: SIDE-CHANNEL ATTACK AND COUNTERMEASURE
Session Chair: Pingqiang Zhou, ShanghaiTech University

• Laser Irradiation on EEPROM Sense Amplifiers Enhances Side-channel Leakage of Read Bits
  Junichi Sakamoto, Daisuke Fujimoto and Tsutomu Matsumoto - Yokohama National U.

• Key Extraction from the Primary Side of a Switched-Mode Power Supply
  Sami Saab, Andrew Leiserson, and Michael Tunstall - Rambus Cryptography Research

• On-Chip Substrate-Bounce Monitoring for Laser-Fault Countermeasure
  Kohei Matsuda, Noriyuki Miura, Makoto Nagata - Kobe U.
  Yu-Ichi Hayashi - Tohoku-Gakuin U.
  Tatsuya Fujii and Kazuo Sakiyama - U. of Electro-Communications

• Comparing Sboxes of Ciphers from the Perspective of Side-Channel Attacks
  Liran Lerman, Olivier Markowitch and Nikita Veshchikov - Universite Libre de Bruxelles

• Chosen Ciphertext Simple Power Analysis on Software 8-bit Implementation of Ring-LWE Encryption
  Aesun Park and Dong-Guk Han - Kookmin U.

12:00 - 1:00PM  Lunch

1:00 - 1:30PM  SESSION 8: INVITED TALK
Session Chair: Domenic Forte, University of Florida
Speaker: Yousef Iskander, CISCO
Title: Ensuring System Integrity and Trust at Cisco
1:30 - 2:50PM  SESSION 9: HARDWARE TROJAN AND DETECTION

Session Chair: Kazuo Sakiyama, University of Electro-Communications

- **An Enhanced Classification-based Golden Chips-Free Hardware Trojan Detection Technique**
  Mingfu Xue, Jian Wang - Nanjing U. of Aeronautics and Astronautics
  Aiqun Hu - Southeast U.

- **Test Generation for Combinational Hardware Trojans**
  Sying-Jyan Wang, Jhih-Yu Wei, Shih-Heng Huang - National Chung-Hsing U.
  Katherine Shu-Min Li – National Sun Yat-sen U.

- **RECORD: Temporarily Randomized Encoding of Combinational Logic for Resistance to Data Leakage from Hardware Trojan**
  Travis Schulze - Missouri U. of Science and Technology
  Kevin Kwiat, Charles Kamhoua - Air Force Research Laboratory
  Shih-Chieh Chang – National Tsing Hua U.
  Yiyu Shi - U. of Notre Dame

- **Translating Circuit Behavior Manifestations of Hardware Trojans using Model Checkers into Run-time Trojan Detection Monitors**
  Syed Rafay Hasan - Tennessee Tech U.
  Charles Kamhoua, Kevin Kwiat, and Laurent Njilla - Air Force Research Laboratory

2:50 – 3:50PM  SESSION 10: INDUSTRIAL PANEL

Topic: Hardware Security in Semiconductor Industry
Panel Moderator: Gang Qu, University of Maryland
Panelists: Ingrid Verbauwhede, KU Leuven
  Jason Sanabia, Raith America
  Shih-Lien Lu, TSMC
  Yousef Iskander, CISCO
  Garrett Rose, Univ. of Tennessee
  Michael Mehlberg, Rambus

3:50 - 4:00PM  Closing Remarks