Information Security Applications

16th International Workshop, WISA 2015 Jeju Island, Korea, August 20–22, 2015 Revised Selected Papers



Contents

Hardware Security

M-ORAM: A Matrix ORAM with Log N Bandwidth Cost Steven Gordon, Atsuko Miyaji, Chunhua Su, and Karin Sumongkayothin	3
Process Variation Evaluation Using RO PUF for Enhancing SCA-Resistant Dual-Rail Implementation	16
Compact Implementations of LEA Block Cipher for Low-End Microprocessors	28
Compact Implementations of LSH	41
Detection of Rogue Devices in WLAN by Analyzing RF Features and Indoor Location of the Device	54
Cryptography	
Security Analysis on RFID Mutual Authentication Protocol You Sung Kang, Elizabeth O'Sullivan, Dooho Choi, and Maire O'Neill	65
How Much Randomness Can Be Extracted from Memoryless Shannon Entropy Sources?	75

muciej skorski	
Two Types of Special Bases for Integral Lattices	87
Keyword Updatable PEKS Hyun Sook Rhee and Dong Hoon Lee	96
On Partitioning Secret Data Based on Concept of Functional Safety Seira Hidano and Shinsaku Kiyomoto	110
Unbounded Hierarchical Identity-Based Encryption with Efficient Revocation	122

AIV CONCINS	XIV	Contents
-------------	-----	----------

Publishing Graph Data with Subgraph Differential Privacy Binh P. Nguyen, Hoa Ngo, Jihun Kim, and Jong Kim	134
An Improved Analysis of Broadcast Attacks on the GGH Cryptosystem Maoning Wang	146
Side Channel Attacks and Countermeasures	
Secure Binary Field Multiplication Hwajeong Seo, Chien-Ning Chen, Zhe Liu, Yasuyuki Nogami, Taehwan Park, Jongseok Choi, and Howon Kim	161
An Improved Second-Order Power Analysis Attack Based on a New Refined Expecter: - Case Study on Protected AES Hyunjin Ahn, Neil Hanley, Maire O'Neill, and Dong-Guk Han	174
Various Threat Models to Circumvent Air-Gapped Systems for Preventing Network Attack	187
An Improved Masking Scheme for S-Box Software Implementations Sungjun Ahn and Dooho Choi	200
Security and Threat Analysis	
Open Sesame! Hacking the Password Hwajeong Seo, Zhe Liu, Gyuwon Seo, Taehwan Park, Jongseok Choi, and Howon Kim	215
BurnFit: Analyzing and Exploiting Wearable Devices Dongkwan Kim, Suwan Park, Kibum Choi, and Yongdae Kim	227

Encryption is Not Enough: Inferring User Activities on KakaoTalk	
with Traffic Analysis	254
Kyungwon Park and Hyoungshick Kim	

IoT Security

Challenges in Deploying CoAP Over DTLS in Resource Constrained	
Environments	269
Hyeokjin Kwon, Jiye Park, and Namhi Kang	

Resource Server Jungsoo Park, Jinouk Kim, Minho Park, and Souhwan Jung	281
Cyber Security Considerations for Designing IoT-Based Control Systems Kwangho Kim	288
Frying PAN: Dissecting Customized Protocol for Personal Area Network Kibum Choi, Yunmok Son, Jangjun Lee, Suryeon Kim, and Yongdae Kim	300
Structured Design Approach for an Optimal Programmable Synchronous Security Processor	313
On Zero Knowledge Argument with PQT Soundness Guifang Huang and Hongda Li	326
Network Security	
Performance Analysis of Multiple Classifier System in DoS Attack Detection	339
Changes of Cybersecurity Legal System in East Asia: Focusing on Comparison Between Korea and Japan <i>Kwangho Kim, Sangdon Park, and Jongin Lim</i>	348
Applying Recurrent Neural Network to Intrusion Detection with Hessian Free Optimization Jihyun Kim and Howon Kim	357
Application Security	
Cost-Effective Modeling for Authentication and Its Application to Activity Tracker	373
Fully Batch Processing Enabled Memory Integrity Verification Algorithm Based on Merkle Tree Se Hwan Kim, Yonggon Kim, Ohmin Kwon, and Hyunsoo Yoon	386
Automatic Security Classification with Lasso Paal E. Engelstad, Hugo Hammer, Kyrre Wahl Kongsgård, Anis Yazidi, Nils Agne Nordbotten, and Aleksander Bai	399
Constructing Efficient PAKE Protocols from Identity-Based KEM/DEM Kyu Young Choi, Jihoon Cho, Jung Yeon Hwang, and Taekyoung Kwon	411

A Study of OAuth 2.0 Risk Notification and Token Revocation from

How to Demonstrate Our Presence Without Disclosing Identity? Evidence	
from a Grouping-Proof Protocol	423
Yunhui Zhuang, Gerhard P. Hancke, and Duncan S. Wong	
Author Index	437