Communications in Computer and Information Science

746

Commenced Publication in 2007 Founding and Former Series Editors: Alfredo Cuzzocrea, Xiaoyong Du, Orhun Kara, Ting Liu, Dominik Ślęzak, and Xiaokang Yang

Editorial Board

Simone Diniz Junqueira Barbosa

Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Rio de Janeiro. Brazil

Phoebe Chen

La Trobe University, Melbourne, Australia

Joaquim Filipe

Polytechnic Institute of Setúbal, Setúbal, Portugal

Igor Kotenko

St. Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences, St. Petersburg, Russia

Krishna M. Sivalingam

Indian Institute of Technology Madras, Chennai, India

Takashi Washio

Osaka University, Osaka, Japan

Junsong Yuan

Nanyang Technological University, Singapore, Singapore

Lizhu Zhou

Tsinghua University, Beijing, China

More information about this series at http://www.springer.com/series/7899

Sabu M. Thampi · Gregorio Martínez Pérez Carlos Becker Westphall · Jiankun Hu Chun I. Fan · Félix Gómez Mármol (Eds.)

Security in Computing and Communications

5th International Symposium, SSCC 2017 Manipal, India, September 13–16, 2017 Proceedings



Editors

Sabu M. Thampi

Indian Institute of Information Technology and Management Kerala (IIITMK)

Trivandrum, Kerala

India

Gregorio Martínez Pérez University of Murcia

Murcia Spain

Carlos Becker Westphall

Federal University of Santa Catarina

Florianópolis, Santa Catarina

Brazil

Jiankun Hu RMIT University Melbourne, VIC Australia

Chun I. Fan

National Sun Yat-sen University

Kaohsiung Taiwan

Félix Gómez Mármol

University of Murcia

Murcia Spain

ISSN 1865-0929 ISSN 1865-0937 (electronic) Communications in Computer and Information Science ISBN 978-981-10-6897-3 ISBN 978-981-10-6898-0 (eBook) https://doi.org/10.1007/978-981-10-6898-0

Library of Congress Control Number: 2017957559

© Springer Nature Singapore Pte Ltd. 2017

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer Nature Singapore Pte Ltd.

The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Preface

These proceedings contain papers selected for presentation at the 5th International Symposium on Security in Computing and Communications (SSCC 2017). SSCC aims to provide an opportunity to bring together researchers and practitioners from both academia and industry to exchange knowledge and discuss research findings. The symposium was held in Manipal Institute of Technology, Manipal University, Karnataka, India, during September 13–16, 2017. SSCC 2017 was co-located with the International Conference on Applied Soft Computing and Communication Networks (ACN 2017).

In response to the call for papers 84 papers were submitted to the symposium. These papers were evaluated on the basis of their significance, novelty, and technical quality. A double-blind review process was conducted to ensure that the author names and affiliations were unknown to the Technical Program Committee (TPC). Each paper was reviewed by the members of the TPC and finally, 21 regular papers and 13 short papers were selected for presentation at the symposium (acceptance ratio: $\sim 40\%$).

The organization of the symposium benefited from the efforts of many individuals. We would like to thank the TPC members and external reviewers for their timely expertise in carefully reviewing the submissions. We would like to thank the general chair and members of the Advisory Committee for their support. We express our most sincere thanks to all keynote speakers who shared with us their expertise and knowledge.

Special thanks to members of the Organizing Committee for their time and effort in organizing the symposium. We wish to thank all the authors who submitted papers and all participants and contributors to fruitful discussions. Finally, we would like to acknowledge Springer for the active cooperation and timely production of the proceedings.

September 2017

Sabu M. Thampi Gregorio Martínez Pérez Carlos Becker Westphall Jiankun Hu Chun-I Fan Félix Gómez Mármol

Organization

Chief Patron

Ramdas M. Pai Manipal University, India

Patrons

H.S. Ballal Manipal University, India
B.H.V. Pai MIT, Manipal University, India
G.K. Prabhu MIT, Manipal University, India
Narayan Sabhahit Manipal University, India
V. Surendra Shetty Manipal University, India
H. Vinod Bhat Manipal University, India

Advisory Committee

John F. Buford Avaya Labs Research, USA

Mauro Conti SPRITZ Security and Privacy Research Group,

University of Padua, Italy

Xavier Fernando Ryerson University, Canada

David Naccache ENS Paris, France

Prasad Naldurg IBM Research India, Bangalore

Anand R. Prasad NEC, Japan

Bimal Kumar Roy R.C. Bose Centre for Cryptology and Security,

Indian Statistical Institute, India

Somitra Kr. Sanadhya IIIT Delhi, India

Zhili Sun Institute for Communication Systems (ICS),

University of Surrey, UK

Shambhu J. Upadhyaya State University of New York at Buffalo, USA

V.N. Venkatakrishnan University of Illinois at Chicago, USA

Guojun Wang Central South University, China

General Chair

Sudip Misra Indian Institute of Technology, Kharagpur, India

Program Chair

Gregorio Martínez Pérez University of Murcia, Spain

Program Co-chairs

Chun-I Fan National Sun Yat-sen University, Taiwan

Félix Gómez Mármol University of Murcia, Spain Jiankun Hu RMIT University, Australia

Ryan Ko University of Waikato, New Zealand

Publicity Chair

Carlos Becker Westphall Federal University of Santa Catarina, Brazil

Steering Committee Chair

Sabu M. Thampi IIITM-Kerala, India

Organizing Chair

Hareesha K.S. Manipal Institute of Technology (MIT) - Manipal

University, India

Organizing Co-chairs

Balachandra Manipal Institute of Technology, Manipal University,

India

Ashalatha Nayak Manipal Institute of Technology, Manipal University,

India

Organizing Secretaries

Renuka A. Manipal Institute of Technology, Manipal University,

India

Preetham Kumar Manipal Institute of Technology, Manipal University,

India

Poornima P.K. Manipal Institute of Technology, Manipal University,

India

Technical Program Committee/Additional Reviewers

Rajan A. Tata Consultancy Services, India

Davide Adami CNIT Pisa Research Unit, University of Pisa, Italy

Rachit Adhvaryu Gujarat Technological University, India

Sasan Adibi Deakin University, Australia

Deepak Aeloor St. John College of Engineering and Technology, India

Afrand Agah West Chester University of Pennsylvania, USA

S. Agrawal Delhi Technological University (DTU) Formerly Delhi

College of Engineering (DCE), India

Musheer Ahmad Jamia Millia Islamia, New Delhi, India Maurizio Aiello National Research Council, CNR-IEIIT, Italy Jose Maria Alcaraz Calero University of the West of Scotland, UK

Syed Taqi Ali NIT Kurukshetra, India

Karim Al-Saedi University of Mustansiriyah, Iraq

Kimaya Ambekar K.J. SIMSR, India

S. Anandhi PSG College of Technology, India

Gopalasingham Nokia Bell Labs, France

Aravinthan

Claudio Ardagna Università degli Studi di Milano, Italy

Reza Atani University of Guilan, Iran Osama Attia Intel Corporation, USA

Dhouha Ayed Thales, France

Asrul Izam Azmi Universiti Teknologi Malaysia, Malaysia

Ramesh Babu DSCE, Bangalore, India V. Balamurugan Sathyabama University, India Nikolaos Bardis Hellenic Military Academy, Greece

Ingmar Baumgart Karlsruhe Institute of Technology (KIT), Germany

Salah Benbrahim Ecole Polytechnique, Canada
Jalel Ben-Othman University of Paris 13, France
Bruhadeshwar Bezawada Mahindra Ecole Centrale, India

Aniruddha Bhattachariya Guru Nanak Institute of Technology (GNIT), India Debojyoti Bhattacharya Robert Bosch Engineering and Business Solutions Ltd.,

India

Tapalina Bhattasali University of Calcutta, India B. Borah Tezpur University, India

Karima Boudaoud University of Nice Sophia Antipolis, France

Kai Bu Zhejiang University, P.R. China

John Buford Koopid Inc., USA

Christian Callegari RaSS National Laboratory - CNIT, Italy
Enrico Cambiaso National Research Council, CNR-IEIIT, Italy
Zhenfu Cao Shanghai Jiao Tong University, P.R. China

Shih-Hao Chang Tamkang University, Taiwan

Madhumita Chatterjee Pillai Institute of Information Technology, India
Nirbhay Chaubey Institute of Science and Technology for Advanced

Studies and Research, India

Ankit Chaudhary Northwest Missouri State University, USA

Feng Cheng University of Potsdam, Germany

Deepak Choudhary LPU, India

Maxwell Christian Gujarat Technological University, India

Chung-Hua Chu National Taichung Institute of Technology, Taiwan

Phan Cong-Vinh
Nora Cuppens-Boulahia
Anil Dahiya
Saad Darwish
NTT University, Vietnam
IT TELECOM Bretagne, France
Manipal University Jaipur, India
University of Alexandria, Egypt

Ashok Kumar Das International Institute of Information Technology,

Hyderabad, India

Pratish Datta Indian Institute of Technology Kharagpur, India

Sabrina De Capitani di Università degli Studi di Milano, Italy

Vimercati

Abdelouahid Derhab King Saud University, Saudi Arabia
Aaradhana Deshmukh Andreas Dewald ERNW Research GmbH, Germany

Dhananjoy Dey DRDO, India

Nilanjan Dey West Bengal University of Technology, India

Tassos Dimitriou Computer Technology Institute in Greece and Kuwait

University, Greece

Nikunj Domadiya S.V. National Institute of Technology - Surat (Gujarat),

India

Jignesh Doshi L.J. Institute of Management Studies, Ahmedabad, India

Manali Dubal University of Pune, India

Supriya Dubey Motilal Nehru National Institute of Technology,

Allahabad, India

Zoya Dyka Innovations for High Performance Microelectronics,

Germany

El-Sayed El-Alfy King Fahd University of Petroleum and Minerals

(KFUPM), Saudi Arabia

Azza Elaskary Atomic Energy Authority, Egypt

Ahmed Elmisery Universidad Técnica Federico Santa María, Chile

Eduardo Fernandez Florida Atlantic University, USA Apostolos Fournaris University of Patras, Greece

Alexandros Fragkiadakis Institute of Computer Science, FORTH, Greece

Thomas Gamer ABB AG, Germany

Carlos Gañán Delft University of Technology, The Netherlands

K. Ganesh SVECW, India Gr. Gangadharan IDRBT, India

Praveen Gauravaram
S. Geetha
VIT University Chennai Campus, India
Angelo Genovese
Università degli Studi di Milano, Italy

Vadivelou Gnanapragasam Pondicherry University, India
Mario Goldenbaum Princeton University, USA
Paulo Gondim Universidade de Brasilia, Brazil

R. Goudar Visvesvaraya Technological University, Belagavi, India

D.J. Guan National Sun Yat-Sen University, Taiwan

Sghaier Guizani Alfaisal University, Saudi Arabia

Ankur Gupta Model Institute of Engineering and Technology, India Manish Gupta Hindustan Institute of Technology and Management,

Agra, India

Raju Halder IIT Patna, India

Hani Hamdan CentraleSupélec, Université Paris-Saclay, France Ramesh Hansdah Indian Institute of Science, Bangalore, India Deepthi Haridas Advanced Data Processing Research Institute (ADRIN),

India

Houcine Hassan Universidad Politecnica de Valencia, Spain

Aissaoui Hassane Mines-Telecom Institute/Telecom Paris Tech, France

Christine Hennebert CEA-LETI, France

Wolfgang Hommel Universität der Bundeswehr München, Germany

Gwo-Jiun Horng Southern Taiwan University of Science and Technology,

Taiwan

Asif Iqbal KTH Royal Institute of Technology, Sweden Abdellah Jamali Hassan 1st University-Settat, Morocco Nazarbayev University, Kazakhstan

Alex Pappachen James Nazarbayev University, Kazakhstan Swinburne University of Technology, Australia

Shreenivas Jog Government College of Engineering Pune,

University of Pune, India Prashant Johri Galgotias University, India

Manisha Joshi M.G.M. College of Engineering, India Mohammed Kaabar Washington State University, USA Sandeep Kakde Y.C. College of Engineering, India

Nirmalya Kar National Institute of Technology Agartala, India Kira Kastell Frankfurt University of Applied Sciences, Germany Sokratis Katsikas Norwegian University of Science and Technology,

Norway

Gaurav Khatwani Indian Institute of Management Rohtak, India

Praveen Khethavath
Donghyun Kim
Andreas Kliem
LaGuardia Community College, USA
Kennesaw State University, USA
Technische Universität Berlin, Germany

Ravi Kodali National Institute of Technology, Warangal, India

Jerzy Konorski Gdansk University of Technology, Poland

Dimitrios Koukopoulos University of Patras, Greece

Bogdan Ksiezopolski Maria Curie-Sklodowska University, Poland

Binod Kumar JSPM's Jayawant Institute of Computer Applications,

Pune, India

Chin-Laung Lei
Imre Lendák
Albert Levi
Jiguo Li
Wenzhong Li
Jie Li
Anyi Liu
National Taiwan University, Taiwan
University of Novi Sad, Serbia
Sabanci University, Turkey
Hohai University, P.R. China
Nanjing University, P.R. China
University of Tsukuba, Japan
Oakland University, USA

Jenila Livingston VIT Chennai, India

Luigi Lo Iacono Cologne University of Applied Sciences, Germany

Flavio Lombardi
Pascal Lorenz
University of Rome, Italy
University of Haute Alsace, France
Malamati Louta
University of Western Macedonia, Greece
Rongxing Lu
University of New Brunswick, Canada
Supriya M.
Amrita Vishwa Vidyapeetham, India

Parikshit Mahalle Kashibai Navale College of Engineering, Pune, India

Eman Mahmoodi Stevens Institute of Technology, USA Massudi Mahmuddin Universiti Utara Malaysia, Malaysia

Soumyadev Maity National Institute of Technology, Rourkela, India

Amrita Manjrekar Shivaji University, India

Kyriakos Manousakis Applied Communication Sciences, USA Marius Marcu Politehnica University of Timisoara, Romania

Ninoslav Marina Princeton University, USA

Sjouke Mauw University of Luxembourg, Luxembourg

Michael McGuire University of Victoria, Canada

Jay Merja Gujarat Technological University, India Philippe Merle Inria Lille - Nord Europe, France

Dheerendra Mishra Indian Institute of Technology, Kharagpur, India Amit Mishra Jaypee Institute of Engineering and Technology,

Raghogarh, Guna, M.P., India

Edward Moreno UFS - Federal University of Sergipe, Brazil

Francesco Moscato
Amad Mourad
Antonio Muñoz-Gallego
Aravind Nair
Geetika Narang

Second University of Naples, Italy
University of Bouira, Algeria
University of Malaga, Spain
Amrita University, India
SIT College, India

Pratiksha Natani DIAT, India

T. Nishitha Vasavi College of Engineering, India

Quamar Niyaz University of Toledo, USA

Andreas Noack University of Applied Sciences Stralsund, Germany

Gabriele Oligeri Third University of Rome, Italy

Luís Oliveira IT, UBI and Polytechnic Institute of Tomar, Portugal

Jose A. Onieva University of Malaga, Spain

Jilna P. National Institute of Technology, Calicut, India

Michele Pagano University of Pisa, Italy

Pinakpani Pal Indian Statistical Institute, India

Saibal Pal DRDO, India

Mauricio Papa The University of Tulsa, USA Younghee Park San Jose State University, USA

Thaksen Parvat Sinhgad Institute of Technology, Lonavala, India

Jitendra Patel KD Polytechnic Patan, India Al-Sakib Khan Pathan Southeast University, Bangladesh

Thomas Paul TU Darmstadt, Germany Vishnu Pendyala Santa Clara University, USA

Antonio Pescapé University of Naples Federico II, Italy Sophia Petridou University of Macedonia, Greece Anitha Pillai Hindustan University, Chennai, India

Emmanuel Pilli Malaviya National Institute of Technology, Jaipur, India

Vincenzo Piuri Università degli Studi di Milano, Italy

Geong-Sen Poh MIMOS, Malaysia Anand Prasad NEC Corporation, Japan Neeli Prasad ITU, Center for TeleInFrastructure (CTIF), USA

Kester Quist-Aphetsi University of Brest France, France

National Institute of Technology Goa, India Purushothama R. Kirubakaran R. Kumaraguru College of Technology, India

Anna University, India Anitha R.

Vallikannu R. Hindustan University, Under UGC Act 3, India

Intel Corporation, USA Giuseppe Raffa

Mohammad Rahman KDDI R&D Laboratories, Inc., Japan Cognizant Technology Solutions, India Praveen Kumar Rajendran

Somayaji Siva Rama VIT University, India

Krishnan

Sherif Rashad

Behrooz Razeghi

Tarun Rao Dayanand Sagar College of Engineering, India Defense Research and Development Organisation, Arvind Rao

Ministry of Defence, GOI, India Florida Polytechnic University, USA B.S. Abdur Rahman University, India Nadana Ravishankar Ferdowsi University of Mashhad, Iran

Institut Mines-Telecom, Telecom SudParis, France Eric Renault

Abdalhossein Rezai ACECR, Iran

Simon Pietro Romano University of Naples Federico II, Italy

Indian Institute of Engineering Science and Technology, Animesh Roy

Shibpur, India

University of Murcia, Spain Antonio Ruiz-Martínez

Muthukumar S. Indian Institute of Information Technology, Tamil Nadu,

India

Vinod Chandra S.S. University of Kerala, India

Sudha Sadhasiyam PSG College of Technology, India

Navanath Saharia Indian Institute of Information Technology Manipur,

India

Youssef Said Tunisie Telecom, Tunisia

Kashif Saleem King Saud University, Saudi Arabia Panagiotis Sarigiannidis University of Western Macedonia, Greece

Himangshu Sarma NIT Sikkim, India Kriti Saroha CDAC, India Mrudula Sarvabhatla NBKR IST, India

Indian Institute of Technology Indore, India Rajat Saxena

Jaydip Sen Praxis Business School, India Anirban Sengupta Jadavpur University, India Jagruti Shah Nagpur University, India

V. Shanthi St. Joseph College of Engineering, India MBM Engineering College Jodhpur, India Aditi Sharma Sathyabama University Chennai, India Sandip Shinde

Rajeev Shrivastava MPSIDC, India

All India Institute of Ayureveda (AIIA), India Ajay Shukla

Sabrina Sicari University of Insubria, Italy

Axel Sikora University of Applied Sciences Offenburg, Germany

XIV Organization

Sarbjeet Singh Panjab University, Chandigarh, India

Rajiv Singh Banasthali University, India

Kunwar Singh NIT Trichy, India

Agusti Solanas Rovira i Virgili University, Spain

Vikas Solanke MSBTE, India

Keshav Sood Deakin University, Australia Alessandro Sorniotti IBM Research, Switzerland

Karthik Srinivasan Philips, India

Vartika Srivastava Jaypee Institute of Information and Technology, India

Stormy Stark Penn State University, USA

Maicon Stihler Federal Center for Technological Education -

CEFET-MG, Brazil

Dimitrios Stratogiannis National Technical University of Athens, Greece

Tim Strayer BBN Technologies, USA
Martin Strohmeier University of Oxford, UK
Ravi Subban Pondicherry University, India
ETH Zurich, Switzerland

Siva Rama Krishna T. JNTUK-University College of Engineering

Vizianagaram, India

Rajneesh Talwar CGC Technical Campus, Jhanjeri, Punjab Technical University, India

Cristina Alcaraz Tello University of Malaga, Spain

Geethapriya Thamilarasu
Deepti Theng
Ciza Thomas
Padmaja Thurumella
Anurag Tomar

University of Washington Bothell, USA
G.H. Raisoni College of Engineering, India
College of Engineering Trivandrum, India
K.L. University, Vaddeswaram, India
Lovely Professional University, India

Orazio Tomarchio University of Catania, Italy

Zouheir Trabelsi UAE University, United Arab Emirates

Ha Duyen Trung Hanoi University of Science and Technology, Vietnam

Indumathi T.s. VTU, India

Francesco Tusa University College London, UK Gopinath V. Sathyabama University, India

Odelu Vanga Indian Institute of Information Technology Chittoor,

India

Genoveva Vargas-Solar French Council on Scientific Research, France

Giacomo Verticale Politecnico di Milano, Italy

Divya Vidyadharan College of Engineering, Trivandrum, India

S. Vijaykumar 6TH SENSE, India

Luca Vollero Università Campus Bio-Medico (Roma), Italy Chandra Vorugunti Indian Institute of Information Technology, SriCity,

India

Artemios Voyiatzis SBA Research, Austria

Rahul Waghmare Indian Institute of Space Science and Technology, India

Yong Wang Dakota State University, USA

Qi Wang University of the West of Scotland, UK

Mohammad Wazid IIIT, Hyderabad, India

Chih-Yu Wen National Chung Hsing University, Taiwan

Xiaotong Wu Nanjing University, P.R. China Favetteville State University, USA Bing Wu Yang Xiao The University of Alabama, USA Jiping Xiong Zhejiang Normal University, P.R. China

Tarun Yadav Defence Research and Development Organisation.

Ministry of Defence, GOI, India

Akihiro Yamamura Akita University, Japan

Bo Yan University of Massachusetts Lowell, USA

National Kaohsiung Normal University, Taiwan

Koc University, Turkey

Fagir Yousaf NEC Laboratories, Europe, Germany Meng Yu University of Texas at San Antonio, USA

Chang Wu Yu Chung Hua University, Taiwan

Chau Yuen Singapore University of Technology and Design,

Singapore

Go Yun II Heriot-Watt University Malaysia, Malaysia

University of Kentucky, USA

Shanghai Research Center for Wireless

Communications, P.R. China Stony Brook University, USA

Institute of Computing Technology,

Chinese Academy of Sciences, P.R. China University of Science and Technology Beijing,

P.R. China

Organized by

Chung-Huang Yang

Turker Yilmaz

Sherali Zeadally

Wuxiong Zhang

Peng Zhang

Yujun Zhang

Haijun Zhang



A Constituent Institution of Manipal University



Contents

Diversity-aware, Cost-effective Network Security Hardening Using Attack Graph	1
Fast Verification of Digital Signatures in IoT	16
Efficient and Provably Secure Pairing Free ID-Based Directed Signature Scheme	28
User Authentication Scheme for Wireless Sensor Networks and Internet of Things Using LU Decomposition	39
Detection of Zeus Bot Based on Host and Network Activities	54
An Asymmetric Key Based Efficient Authentication Mechanism for Proxy Mobile IPv6 Networks	65
User Authentication Scheme for Wireless Sensor Networks and Internet of Things Using Chinese Remainder Theorem	79
A Ringer-Based Throttling Approach to Mitigate DDoS Attacks	95
NPSO Based Cost Optimization for Load Scheduling in Cloud Computing	109
Multi-sink En-Route Filtering Mechanism for Wireless Sensor Networks Alok Kumar and Alwyn Roshan Pais	122
Security Schemes for Constrained Application Protocol in IoT: A Precise Survey	134
Jordan Center Segregation: Rumors in Social Media Networks	146

XVIII Contents

User Credentials	159
Multi Class Machine Learning Algorithms for Intrusion Detection - A Performance Study	170
Symmetric Key Based Secure Resource Sharing	179
Prevention of PAC File Based Attack Using DHCP Snooping	195
A Quasigroup Based Synchronous Stream Cipher for Lightweight Applications	205
Security Analysis of Key Management Schemes Based on Chinese Remainder Theorem Under Strong Active Outsider Adversary Model B.R. Purushothama, Arun Prakash Verma, and Abhilash Kumar	215
Deep Learning for Network Flow Analysis and Malware Classification R.K. Rahul, T. Anjali, Vijay Krishna Menon, and K.P. Soman	226
Kernel Modification APT Attack Detection in Android	236
Opaque Predicate Detection by Static Analysis of Binary Executables R. Krishna Ram Prakash, P.P. Amritha, and M. Sethumadhavan	250
An Overview on Spora Ransomware	259
Pattern Generation and Test Compression Using PRESTO Generator	276
Challenges in Android Forensics	286
Current Consumption Analysis of AES and PRESENT Encryption Algorithms in FPGA Using the Welch Method	300
Spiral Model for Digital Forensics Investigation	312

	Contents	XIX
Smart-Lock Security Re-engineered Using Cryptography and Steganography		325
Adding Continuous Proactive Forensics to Android Karthik M. Rao, P.S. Aiyyappan, and Prabhaker Mateti		337
ASLR and ROP Attack Mitigations for ARM-Based Android Devi Vivek Parikh and Prabhaker Mateti	ces	350
CBEAT: Chrome Browser Extension Analysis Tool		364
Hardware Trojan Detection Using Effective Test Patterns and Selective Segmentation		379
Estimation and Tracking of a Ballistic Target Using Sequential Imp Sampling Method		387
An Android Application for Secret Image Sharing with Cloud Stor K. Praveen, G. Indu, R. Santhya, and M. Sethumadhavan	age	399
Tracking of GPS Parameters Using Particle Filter		411
Author Index		423