# 2019 Cybersecurity and Cyberforensics Conference (CCC 2019)

Melbourne, Australia 8 – 9 May 2019



IEEE Catalog Number: ISBN:

CFP19H37-POD 978-1-7281-2601-2

#### **Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved**

*Copyright and Reprint Permissions*: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

# \*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

IEEE Catalog Number:	CFP19H37-POD
ISBN (Print-On-Demand):	978-1-7281-2601-2
ISBN (Online):	978-1-7281-2600-5

#### Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400 Fax: (845) 758-2633 E-mail: curran@proceedings.com Web: www.proceedings.com



# 2019 Cybersecurity and Cyberforensics Conference (CCC) CCC 2019

# **Table of Contents**

Message from the General Chairs ix
Organizing Committee x
Technical Program Committee .xi
Reviewers xiii

# **Session 1: Cloud Computing**

Cloud Based Temperature and Humidity Alert System to Prevent Food	Poisoning .1
Hitendra Patel (Melbourne Institute of Technology), Sajan Sheth	-
(Melbourne Institute of Technology), and S M Farhad (Melbourne	
Institute of Technology)	

Cloud Computing: A Framework for Balancing Accountability and Privacy Based on Multi-Agent System .6..... Yasamin Alagrash (Oakland University), Faisal Alghayadh (Oakland University), Ahmad Alshammari (Oakland University), and Debatosh Debnath (Oakland University)

A Survey of Energy Efficient IoT Network in Cloud Environment .13..... Walid K A Hasan (Aljabal Algharbi University), Yachao Ran (Newcastle University), Johnson Agbinya (Melbourne Institute of Technology), and GuiYun Tian (Newcastle University)

# Session 2: Cyber-Physical Systems and IoT

<ul> <li>Vulnerabilities Analysis and Security Assessment Framework for the Internet of Things .22</li> <li>Rahul Shokeen (Charles Darwin University), Bharanidharan Shanmugam (Charles Darwin University), Krishnan Kannoorpatti (Charles Darwin University), Sami Azam (Charles Darwin University), Mirjam Jonkman (Charles Darwin University), and Mamoun Alazab (Charles Darwin University)</li> </ul>
Countermeasure of Lightweight Physical Unclonable Function Against Side-Channel Attack .30 Yusuke Nozaki (Meijo University) and Masaya Yoshikawa (Meijo University)
Enhanced TL-LEACH routing protocol for large-scale WSN applications .35 Kulsoom Manzoor (University of Sindh Dadu, Pakistan), Sana H. Jokhio (Independent Researcher Melbourne, Australia), Tariq J. S. Khanzada (Mehran University of Eng. & Tech. Jamshoro, Pakistan.), and Imran A. Jokhio (Melbourne Institute of Technology Melbourne, Australia)

#### **Session 3: Security and Privacy for Smart Cities**

Analysis on Nonlinear Characters of Built-in Sensor in Smart Device under the Condition of Voice Actuating .40... Ning Zhao (Wuhan University of Technology, Wuhan, China), Junjie Shen (Wuhan University of Technology, Wuhan, China), Xiaolin Ma (Wuhan University of Technology, Wuhan, China), and Yuhe Liu (Wuhan University of Technology, Wuhan, China.) Improving Accessibility for Mobility Impaired People in Smart City using Crowdsourcing 47..... Yuba Raj Panta (Charles Darwin University), Sami Azam (Charles Darwin University), Bharanidharan Shanmugam (Charles Darwin University), Kheng Cher Yeo (Charles Darwin University), Mirjam Jonkman (Charles Darwin University), Friso De Boer (Charles Darwin University), and Mamoun Alazab (Charles Darwin University) Design of a Hybrid RFID-WLAN Based Smart Parking and Vehicle Finding System .56..... Shumin Li (Melbourne Institute of Technology) and Rajan Kadel

#### (Melbourne Institute of Technology)

## Session 4: Big Data Analytics and Machine Learning

Performance Analysis of Hard Clustering Techniques for Big IoT Data Analytics .62 Mohiuddin Ahmed (Edith Cowan University) and Abu Barkat (Canberra Institute of Technology)
Ransomware Triage Using Deep Learning: Twitter as a Case Study .67 Vinayakumar R (Amrita Vishwa Vidyapeetham University), Mamoun Alazab (Charles Darwin University), Alireza Jolfaei (Macquarie University), Soman KP (Amrita Vishwa Vidyapeetham University), and Prabaharan Poornachandran (Amrita Vishwa Vidyapeetham University)
An Improved Convolutional Neural Network Model for Intrusion Detection in Networks .74 Riaz Ullah Khan (University of Electronic Science and Technology of China), Xiaosong Zhang (University of Electronic Science and Technology of China), Mamoun Alazab (Charles Darwin University), and Rajesh Kumar (University of Electronic Science and Technology of China)
MML Inference of Hierarchical Probabilistic Finite State Machine .78 Vidya Saikrishna (Monash University) and Sid Ray (Monash University)

#### **Session 5: Multimedia Forensics**

A Study on Growth Stage Classification of Paddy Rice by CNN using NDVI In	mages .85
Kazuki Murata (Utsunomiya University), Atsushi Ito (Utsunomiya	-
University), Yukitsugu Takahashi (Utsunomiya University), and Hiroyuki	
Hatano (Mie University)	

A Hybrid Fake Banknote Detection Model using OCR, Face Recognition and Hough Features .9.1...... Adiba Zarin (BRAC University) and Jia Uddin (BRAC University) A Reinforcement Learning Based Algorithm Towards Energy Efficient 5G Multi-Tier Network .96..... Nahina Islam (Central Queensland University, Australia), Ammar Alazab (Melbourne Institute of Technology), and Mamoun Alazab (Charles Darwin University)

# Session 6: Cyberthreat and Social Engineering

# Session 7: Cybercrime Investigation and Prevention

Designing Security Intelligent Agent for Petrol Theft Prevention .123 Mahmoud Bakkar (Emirates Aviation University) and Ammar Alazab (Melbourne Institute of Technology)
A Comprehensive Investigation of Telecom Business Models and Strategies .129
Muzammil M. K. Arisar (BUPT Beijing, China), Ning Lianju (BUPT
Beijing, China), Sun Zhongyuan (BUPT Beijing, China), and Imran A.
Jokhio (Melbourne Institute of Technology Melbourne, Australia)
A Hybrid Technique To Detect Botnets, Based on P2P Traffic Similarity .136
Riaz Ullah Khan (University of Electronic Science and Technology of
China), Rajesh Kumar (University of Electronic Science and Technology
of China), Mamoun Alazab (Charles Darwin University), and Xiaosong
Zhang (University of Electronic Science and Technology of China)

#### **Session 8: Cyber-Enabled Systems and Applications**

Coercion-Resistant E-Voting Scheme with Blind Signatures .143 Ahsan Aziz (Melbourne Institute of Technology)
Information Security: Definitions, Threats and Management in Dubai Hospitals Context .152 Mahmoud Bakkar (Emirates Aviation University) and Ammar Alazab (Melbourne Institute of Technology)
Human Palm Geometry Modelling for Biometric Security Systems .160 Johnson I Agbinya (Melbourne Institute of Technology)

A Comprehensive Protection Method for Securing the Organization's Network Against Cyberattacks .1.18...... Ghassan Kbar (Melbourne Institute of Technology, MIT) and Ammar Alazab (Melbourne Institute of Technology, MIT)

#### Session 9: Blockchain Technology

Tomasz Hyla (West Pomeranian University of Technology, Szczecin, Poland) and Jerzy Peja (West Pomeranian University of Technology, Szczecin, Poland)

Author Index 179