The 2019 IEEE Cybermatics Congress

The 12th IEEE International Conference on Internet of Things (iThings-2019)
The 15th IEEE International Conference on Green Computing and Communications (GreenCom-2019)
The 12th IEEE International Conference on Cyber, Physical and Social Computing (CPSCom-2019)
The 5th IEEE International Conference on Smart Data (SmartData-2019)
The 2019 IEEE International Conference on Blockchain (Blockchain-2019)
The 12th International Conference on Security, Privacy and Anonymity in Computation, Communication and Storage (SpaCCS-2019)

July 14 – July 17, 2019
Atlanta, USA

Conference Program and Information Booklet

Organized by
Georgia State University

Sponsored by
IEEE, IEEE Computer Society, IEEE System, Man, and Cybermatics Society
IEEE Technical Committee on Scalable Computing, IEEE Technical Committee on Cybermatics
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration Desk, Name Badges and Conference Venue Floor Map</td>
<td>1</td>
</tr>
<tr>
<td>Presentation Guidelines</td>
<td>2</td>
</tr>
<tr>
<td>Program Overview</td>
<td>3</td>
</tr>
<tr>
<td>Welcome Message from the Congress Chairs</td>
<td>7</td>
</tr>
<tr>
<td>Congress and Summit Keynotes</td>
<td>8</td>
</tr>
<tr>
<td>Sessions of iThings 2019</td>
<td>21</td>
</tr>
<tr>
<td>Sessions of GreenCom 2019</td>
<td>27</td>
</tr>
<tr>
<td>Sessions of CPSCom 2019</td>
<td>32</td>
</tr>
<tr>
<td>Sessions of SmartData 2019</td>
<td>40</td>
</tr>
<tr>
<td>Sessions of Blockchain 2019</td>
<td>44</td>
</tr>
<tr>
<td>Sessions of SpaCCS 2019</td>
<td>51</td>
</tr>
<tr>
<td>Organizing Committee of Cybermatics 2019</td>
<td>57</td>
</tr>
<tr>
<td>Organizing Committee of iThings 2019</td>
<td>58</td>
</tr>
<tr>
<td>Organizing Committee of GreenCom 2019</td>
<td>59</td>
</tr>
<tr>
<td>Organizing Committee of CPSCom 2019</td>
<td>60</td>
</tr>
<tr>
<td>Organizing Committee of SmartData 2019</td>
<td>61</td>
</tr>
<tr>
<td>Organizing Committee of Blockchain 2019</td>
<td>62</td>
</tr>
<tr>
<td>Organizing Committee of SpaCCS 2019</td>
<td>63</td>
</tr>
<tr>
<td>Conference Venue</td>
<td>65</td>
</tr>
<tr>
<td>Travel Guide</td>
<td>66</td>
</tr>
</tbody>
</table>
Registration Desk

The Registration Desk will be open to assist you at the following times:

- Sunday, July 14, 2019, 8:00am – 4:00pm
- Monday, July 15, 2019, 8:00am – 4:00pm
- Tuesday, July 16, 2019, 8:00am – 4:00pm
- Wednesday, July 17, 2019, 8:00am – 2:00pm

Name Badges and Meal Tickets

All delegates, sponsors and speakers of the IEEE iThings/GreenCom/CPSC2019 and associated workshops will be provided with a name badge, to be collected upon registration. This badge must be worn at all times as it is your official pass to all technical sessions of the conferences and morning and afternoon teas.

There are different meal tickets for the welcome reception on July 14, the three lunches on July 15-17, and the banquet on July 16, respectively.
Presentation Guidelines

Language
The presentation language of the IEEE iThings/GreenCom/CPSCom/SmartData/Blockchain/SpaCCS-2019 and associated workshops is English.

Checking In
Session Chairs are requested to register at least 2 hours before their session, or as soon as the Registration Desk is open.

Setting Up
You are required to arrive at the room (in which you will deliver your talk) 20 minutes before the commencement of the session. Upon arrival please confirm your attendance with the Session Chair and familiarize yourself with the venue.

Please bring with you a single paragraph summary, including your name (as you would like to be introduced), affiliation and research interests (maximum 100 words). Please present this to the Session Chair upon arrival, for use for introductory purposes, prior to your talk.

Upon arrival, please copy your slides file to the presentation computer. If you plan to use your own equipment, please ensure it is ready to go prior to the session commencing, since there is very little time between presentations. If you have requested optional equipment, ensure that is in the room. In the larger conference rooms please, make sure you familiarise yourself with the audio system. For all assistance, please speak to the Session Chair.

Timing
Please ensure your check the program for the exact time of your session and where your paper falls within the session.

It is recommended that all IEEE iThings/GreenCom/CPSCom/SmartData/Blockchain/SpaCCS-2019 paper presentations use 20 minutes presentation time including 5 minutes question time. However, the Session Chairs will determine the exact presentation time for each paper, based on the number of presentations in each session. The Session Chairs will ensure that you do not over-run the time allocated.

Please keep strictly to this time guideline

Posters
One A1-size poster slot (portrait style) will be provided for each presenter.
### Program Overview

#### Sunday July 14, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00-16:00</td>
<td>Registration (In front of Room Georgia 1)</td>
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</tr>
<tr>
<td>09:00-09:10</td>
<td>Opening Remarks</td>
<td>Atlanta 1</td>
</tr>
<tr>
<td>09:10-10:25</td>
<td>AIChain Workshop Session #1</td>
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<tr>
<td>10:25-10:35</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>10:35-11:50</td>
<td>AIChain Workshop Session #2</td>
<td></td>
</tr>
<tr>
<td>11:50-12:00</td>
<td>Workshop Summary and Wrap-up</td>
<td></td>
</tr>
<tr>
<td>09:00-9:05</td>
<td>Welcome</td>
<td>Atlanta 2</td>
</tr>
<tr>
<td>09:05-10:15</td>
<td>Workshop Keynote</td>
<td></td>
</tr>
<tr>
<td>10:30-12:30</td>
<td>LightChain Workshop Session #1</td>
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</tr>
<tr>
<td>12:30-13:30</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>13:30-15:30</td>
<td>LightChain Workshop Session #2</td>
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<tr>
<td>15:30-15:35</td>
<td>Close Remark</td>
<td></td>
</tr>
<tr>
<td>18:00-20:30</td>
<td>Reception (Capitol Center)</td>
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<tr>
<td>08:00-16:00</td>
<td>Registration (In front of Room Georgia 1)</td>
<td>Capitol North</td>
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<tr>
<td>09:00-09:40</td>
<td>Opening</td>
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</tbody>
</table>
| 09:40-10:40  | **Keynote 1:** How Machine Learning and AI will revolutionize the Future Real-time Applications in the context of Brooks-Iyengar Algorithm  
**S. S. Iyengar,** Florida International University, USA |               |
| 10:40-11:10  | **Coffee Break** (Capitol Prefunction)                                |               |
| 11:10-12:30  | **Atlanta 1**  
Blockchain-M1: Attacks on Blockchain  
Blockchain-M2: Blockchain Performance Analysis  
GreenCom-1 Optimization and Analysis in GreenCom  
SpaCCS-M1: Security in Comm. (I) |               |
| 12:30-13:30  | **Lunch** (Garden Courtyard)                                          |               |
| 13:30-14:50  | **Atlanta 2**  
Blockchain-M3: Hybrid Blockchain Architecture  
Blockchain-M4: Blockchain Protocol  
SmartData-S1: BD Analytics & Services (I)  
GreenCom-2 Green Comm. and Network (I)  
SpaCCS-M4: Security in Computation (I)  
CPSCom-Poster Session 1 |               |
| 14:50-15:20  | **Coffee Break** (Capitol Prefunction)                                |               |
| 15:20-17:00  | **Atlanta 3**  
Blockchain-M5: Game Theory and Algorithms  
Blockchain-M6: Blockchain and IoT  
SmartData-S2: BD Analytics & Service (II)  
GreenCom-3 Smart Grid  
SpaCCS-M5: Security in Comm. (II)  
CPSCom-Poster Session 2 |               |
| 17:10-18:30  | **IEEE Cybermatics Summit on Cyber Science and Engineering** (Capitol North)  
**Speakers:** Stephen S. Yau, Jianhua Ma, Schahram Dustdar, Victor C.M. Leung, Parimala Thulasiraman |               |
## Tuesday July 16, 2019

**Registration** (In front of Room Georgia 1)

<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Event</th>
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<tbody>
<tr>
<td>08:00-16:00</td>
<td>Capitol North</td>
<td>Registration (In front of Room Georgia 1)</td>
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</tbody>
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<tr>
<th>Time</th>
<th>Room</th>
<th>Event</th>
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<tbody>
<tr>
<td>09:00-10:00</td>
<td></td>
<td><strong>Keynote 2</strong>: Edge Intelligence: The Convergence of Humans, Things, and AI</td>
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<td><strong>Schahram Dustdar</strong>, TU Wien, Austria</td>
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<td>10:00-11:00</td>
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<td><strong>Keynote 3</strong>: Blockchain: The Good, The Bad, and The Ugly</td>
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<td><strong>Richard R. Brooks</strong>, Clemson University, USA</td>
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<td>11:00-11:20</td>
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<td><strong>Coffee Break</strong> (Capitol Prefunction)</td>
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<tr>
<td>11:20-12:40</td>
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<td><strong>Blockchain</strong>-M7: Blockchain Measurement</td>
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<td>Atlanta 1</td>
<td>Blockchain-M8: Applied Cryptography in Blockchain</td>
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<td>Atlanta 2</td>
<td>Blockchain-M11: Permissioned Blockchain</td>
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<tr>
<td></td>
<td>Atlanta 3</td>
<td>GreenCom-4: Green Comm. and Networking (II)</td>
</tr>
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<td>Atlanta 4</td>
<td>SpaCCS-M7: Anonymity</td>
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<tr>
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<td>Atlanta 5</td>
<td>CPSCom-5: CPSS Network and Comm. (I)</td>
</tr>
<tr>
<td></td>
<td>Georgia 2</td>
<td>SpaCCS-W1: Security and Privacy on IoT</td>
</tr>
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<td>Georgia 3</td>
<td>iThings-6: IoT Enabling Technology (II)</td>
</tr>
<tr>
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<td>Georgia 4</td>
<td>iThings-7: IoT Networks and Comm. (II)</td>
</tr>
<tr>
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<td>Georgia 5</td>
<td>CPSCom-4: CPSS Technologies and Apps (I)</td>
</tr>
<tr>
<td>12:40-13:40</td>
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<td><strong>Lunch</strong> (Garden Courtyard)</td>
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<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>13:40-15:00</td>
<td></td>
<td><strong>Blockchain</strong>-M9: Blockchain Application</td>
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<tr>
<td></td>
<td>Atlanta 1</td>
<td>Blockchain-M10: BC Threat and Enhancement (I)</td>
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<td>Atlanta 2</td>
<td>SmartData-M1: Smart Data Processing &amp; Analytics</td>
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<td>Atlanta 3</td>
<td>GreenCom-5: Green Society Application (I)</td>
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<td>Atlanta 4</td>
<td>SpaCCS-M8: Security in Comm. (III)</td>
</tr>
<tr>
<td></td>
<td>Atlanta 5</td>
<td>CPSCom-Poster Session 3</td>
</tr>
<tr>
<td></td>
<td>Georgia 2</td>
<td>SpaCCS-W2: Sensor-Cloud Systems I</td>
</tr>
<tr>
<td></td>
<td>Georgia 3</td>
<td>iThings-8: IoT Services &amp; Intelligence (II)</td>
</tr>
<tr>
<td></td>
<td>Georgia 4</td>
<td>iThings-9: IoT Systems (II)</td>
</tr>
<tr>
<td></td>
<td>Georgia 5</td>
<td>CPSCom-6: CPSS Technologies and Apps (II)</td>
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<tr>
<td>15:00-15:20</td>
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<td><strong>Coffee Break</strong> (Capitol Prefunction)</td>
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<tr>
<th>Time</th>
<th>Room</th>
<th>Event</th>
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<tr>
<td>15:20-17:40</td>
<td></td>
<td><strong>Blockchain</strong>-S1: Blockchain Enhancement (I)</td>
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<tr>
<td></td>
<td>Atlanta 1</td>
<td>Blockchain-S2: Blockchain Enhancement (II)</td>
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<td></td>
<td>Atlanta 2</td>
<td>SmartData-M2: Smart Data Application</td>
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<td>Atlanta 3</td>
<td>GreenCom-6: Green Tech for 5G</td>
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<td>Atlanta 4</td>
<td>SpaCCS-M9: Security in Comm. (IV)</td>
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<td>Atlanta 5</td>
<td>CPSCom-Poster Session 4</td>
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<td></td>
<td>Georgia 2</td>
<td>SpaCCS-W3: Sensor Cloud Syst. (II)</td>
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<tr>
<td></td>
<td>Georgia 3</td>
<td>iThings-10: IoT Smart Application (II)</td>
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<tr>
<td></td>
<td>Georgia 4</td>
<td>GreenCom-7: Green Society Application (II)</td>
</tr>
<tr>
<td></td>
<td>Georgia 5</td>
<td>CPSCom-7: CPSS Network and Comm. (II)</td>
</tr>
</tbody>
</table>
## Tuesday July 16, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 17:00-18:30  | **IEEE Cybermatics Summit on Blockchain: Advances, Challenges & Applications** (Capitol North)  
**Speakers:** Zheng Yan, Ruppa K. Thulasiram, Stefan Schmid, Hao Wang |
| 19:00-21:30  | **Banquet** (Capitol South/Center)  
(Best Paper Awards and Service Awards) |

## Wednesday July 17, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>08:00-14:00</td>
<td><strong>Registration</strong> (In front of Room Georgia 1)</td>
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<tr>
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<td><strong>Room</strong> Capitol North</td>
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</table>
| 09:00-10:00  | **Keynote 4:** Connecting Space Assets to the Internet: Challenges and Solutions  
**Mohammed Atiquzzaman,** University of Oklahoma, USA |
| 10:00-11:00  | **Keynote 5:** Blockchain: Delivering on the Promise to the Verticals  
**James Irvine,** University of Strathclyde, UK |
| 11:00-11:20  | **Coffee Break** (Capitol Prefunction)                              |
|              | **Room** Atlanta 1                                                   |
| 11:20-12:40  | **Blockchain-S4:** Blockchain Platform I                            |
| 12:40-13:40  | **Lunch** (Garden Courtyard)                                         |
| 13:40-15:00  | **Blockchain-S6:** Blockchain Platform III                           |
|              | **Atlantic 2**                                                      |
|              | **Blockchain-S5:** Blockchain Platform II                           |
|              | **SpaCCS-W4:** Trust, Security and Privacy for Emerging Applications |
|              | **Georgia 3**                                                       |
|              | **Blockchain-S3:** Blockchain Marketplace                            |
|              | **SpaCCS-W5:** UbiSafe Computing                                      |
|              | **SpaCCS-W6:** Cybersecurity Metrics and Risk Modelling             |
Welcome Message from the Congress Chairs

Advances in computers, information and networks are bringing a digital cyber world to our daily lives. Numerous digital things or cyber entities are generated and will reside in the cyber world. Meanwhile, countless real things in the conventional physical, social and mental worlds will possess cyber mappings or cyber components, to have a cyber existence in cyber world. Cyberization is an emerging trend forming the new cyber world and reforming conventional worlds towards cyber-enabled hyper worlds. Cybermatics is to build systematic knowledge about new phenomena, behaviors, properties and practices in the cyberspace, cyberization and cyber-enabled hyper worlds. Cybermatics is characterized by not only catching up with the human intelligence (intelligent sensing, decision making, control, etc.), but also learn from the nature-inspired attributes (dynamics, self-adaptability, energy saving, etc.).

The IEEE Cybermatics Congress originated from the 2013 World Cybermatics Congress (Beijing, China). Cybermatics 2019 in Atlanta is the continuation after the success of Cybermatics 2018 in Halifax, Cybermatics 2017 in Exeter, Cybermatics 2016 in Chengdu, Cybermatics 2015 in Sydney, and Cybermatics 2014 in Taipei. IEEE Cybermatics 2019 aims to provide a high-profile platform for researchers and engineers to exchange and explore state-of-art innovations in cyber technology and their applications in physical, social and mental worlds.

The congress consists of the following 6 co-located conferences:

- The 2nd IEEE International Conference on Blockchain (Blockchain 2019)
- The 5th IEEE International Conference on Smart Data (SmartData 2019)
- The 12th IEEE International Conference on Cyber, Physical and Social Computing (CPSCom 2019)
- The 12th IEEE International Conference on Internet of Things (iThings 2019)
- The 15th IEEE International Conference on Green Computing and Communications (GreenCom 2019)
- The 12th International Conference on Security, Privacy and Anonymity in Computation, Communication and Storage (SpaCCS 2019)

An international conference can be organized by supports and great voluntary efforts of many people and organizations. Our main responsibility is to coordinate various tasks with other willing and talented volunteers. We would like to thank all general chairs of the above 6 conferences for their successful organization and all program chairs for making the excellent four-day technical program. We also would like to express our appreciation for the excellent local team from Georgia State University for their wonderful local arrangement and the detailed registration work. We also would like to take the opportunity to thank all the members of the organizing committee, the publicity chairs and technical program committee as well as all authors and reviewers who contributed to the conferences.

We deeply appreciate the distinguished congress keynote speakers as well as the summits' keynotes for sharing with us their latest research advances.

Last but the least, the support from IEEE, IEEE Computer Society, IEEE System, Man and Cybernetics Society, IEEE CS Technical Committee on Scalable Computing (TCSC) and IEEE SMC Technical Committee on Cybermatics is highly appreciated. We hope you find the congress a stimulating and exciting forum and enjoy the beautiful and vibrant Atlanta.

Yi Pan, Regents’ Professor and Chair
Department of Computer Science
Georgia State University, USA
Congress General Chair

Jianhua Ma, Professor
Hosei University, Japan
Chair, IEEE SMC TC Cybermatics
Funding Chair, IEEE CIS SWTC
Congress Steering Chair

Laurence T. Yang, Professor, FCAE & FEIC
Chair, CS TC on Scalable Computing
Chair, IEEE SMC TC on Cybermatics
St Francis Xavier University, Canada
Congress Steering Chair
Congress Keynotes Overview

**Keynote: S. S. Iyengar**, Florida International University, USA
How Machine Learning and AI will revolutionize the Future Real-time Applications in the context of Brooks-Iyengar Algorithm

**Keynote: Schahram Dustdar**, TU Wien, Austria
Edge Intelligence: The Convergence of Humans, Things, and AI

**Keynote: Mohammed Atiquzzaman**, University of Oklahoma, USA
Connecting Space Assets to the Internet: Challenges and Solutions

**Keynote: Richard R. Brooks**, Clemson University, USA
Blockchain: The Good, The Bad, and The Ugly

**Keynote: James Irvine**, University of Strathclyde, UK
Blockchain: Delivering on the Promise to the Verticals
Keynote: How Machine Learning and AI will revolutionize the Future Real-time Applications in the context of Brooks-Iyengar Algorithm

S. S. Iyengar, Florida International University, USA

About the Keynote Speaker

S. S. Iyengar is a Distinguished Ryder Professor and Director of the School of Computing and Information Sciences at Florida International University, Miami. Dr. Iyengar is a pioneer in the field of distributed sensor networks/sensor fusion, computational aspects of robotics and high performance computing. He has published over 600 research papers and has authored/editied 22 books published by MIT Press, John Wiley & Sons, Prentice Hall, CRC Press, Springer Verlag, etc. These publications have been used in major universities all over the world. He has many patents and some patents are featured in the World’s Best Technology Forum in Dallas, Texas. His research publications are on the design and analysis of efficient algorithms, parallel computing, sensor networks, and robotics. During the last four decades, he has supervised over 55 Ph.D. students, 100 Master’s students, and many undergraduate students who are now faculty at Major Universities worldwide or Scientists or Engineers at National Labs/Industries around the world. He has also had many undergraduate students working on his research projects. Recently, Dr. Iyengar received the Times Network 2017 Nonresident Indian of the Year Award—a prestigious award for Global Indian leaders.

Dr. Iyengar is a member of the European Academy of Sciences, a Fellow of IEEE, a Fellow of ACM, a Fellow of AAAS, a Fellow of the National Academy of Inventors NAI and a Fellow of Society of Design and Process Program (SPDS), Fellow of Institution of Engineers (FIE), a Fellow of the American Institute for Medical and Biological Engineering (AIMBE), was awarded a Distinguished Alumnus Award of the Indian Institute of Science, Bangalore, and the IEEE Computer Society Technical Achievement for the contributions to sensor fusion algorithms, and parallel algorithms. He also received the IBM Distinguished Faculty Award, NASA Fellowship Summer Awards at Oakridge National Lab and the Jet Propulsion Laboratory. He is a Village Fellow of the Academy of Transdisciplinary Learning and Advanced Studies in Austin, Texas, 2010.

Summary:

This talk will focus on computational theories of Machine Learning in the context of BI algorithm when it was published in early 90’s. The first part of the talk explores the optimality and adaptively of choosing step sizes of gradient descent for escaping strict saddle points in non-convex optimization problem. Specifically, the speaker will present the problem of subspace clustering with noisy and missing data, which is a problem well motivated by practical applications. Many examples will be illustrated to see the power of Machine Learning and Deep learning techniques for real-time applications.
Keynote: Edge Intelligence: The Convergence of Humans, Things, and AI

Schahram Dustdar, TU Wien, Austria

About the Keynote Speaker

Schahram Dustdar is Full Professor of Computer Science heading the Research Division of Distributed Systems at the TU Wien, Austria. He also holds several honorary positions: Monash University in Melbourne Australia, Shanghai University in China, Macquarie University in Sydney Australia, and University of Groningen (RuG), The Netherlands (2004-2010). From Dec 2016 until Jan 2017 he was a Visiting Professor at the University of Sevilla, Spain and from January until June 2017 he was a Visiting Professor at UC Berkeley, USA.

He is co-Editor-in-Chief of the new ACM Transactions on Internet of Things (ACM TIoT) as well as Editor-in-Chief of Computing (Springer). He is an Associate Editor of IEEE Transactions on Services Computing, IEEE Transactions on Cloud Computing, ACM Transactions on the Web, and ACM Transactions on Internet Technology, as well as on the editorial board of IEEE Internet Computing and IEEE Computer. Dustdar is recipient of the ACM Distinguished Scientist award (2009), the IBM Faculty Award (2012), an elected member of the Academia Europaea: The Academy of Europe, where he is chairman of the Informatics Section, as well as an IEEE Fellow (2016).

Summary:

Edge AI and Human Augmentation are two major technology trends, driven by recent advancements in edge computing, IoT, and AI accelerators. As humans, things, and AI continue to grow closer together, systems engineers and researchers are faced with new and unique challenges. In this talk, we analyze the role of Edge computing and AI in the evolution of cyber-human partnerships and identify challenges that Edge computing systems will consequentially be faced with. We take a closer look at how a cyber-physical fabric will be complemented by AI operationalization to enable seamless end-to-end Edge intelligence systems.
Keynote: Connecting Space Assets to the Internet: Challenges and Solutions
Mohammed Atiquzzaman, University of Oklahoma, USA

About the Keynote Speaker

Mohammed Atiquzzaman obtained his M.S. and Ph.D. in Electrical Engineering and Electronics from the University of Manchester (UK) in 1984 and 1987, respectively. He currently holds the Edith J Kinney Gaylord Presidential professorship in the School of Computer Science at the University of Oklahoma.


His current research interests are in areas of transport protocols, wireless and mobile networks, ad hoc networks, satellite networks, power-aware networking, and optical communications. His research has been funded by National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), U.S. Air Force, Cisco, Honeywell, Oklahoma Department of Transportation and Oklahoma Highway Safety Office.

Summary:

Data communications between Earth and spacecrafts, such as satellites, have traditionally been carried out through dedicated links. Shared links using Internet Protocol-based communication offers a number of advantages over dedicated links. The movement of spacecrafts however gives rise to mobility management issues.

This talk will discuss various mobility management solutions for extending the Internet connection to spacecrafts. The talk will provide an overview of the network layer based solution being developed by the Internet Engineering Task Force and compare with the transport layer based solution that have been developed at University of Oklahoma in conjunction with the National Aeronautics and Space Administration. Network in motion is an extension of the host mobility protocols for managing the mobility of networks which are in motion, such as those in airplanes and trains. The application of networks in motion will be illustrated for both terrestrial and space environment.
The 2019 IEEE Cybermatics Congress  
IEEE iThings/GreenCom/CPSCcom/SmartData/Blockchain/SpaCCS-2019

**Keynote: Blockchain: The Good, The Bad, and The Ugly**  
*Richard R. Brooks, Clemson University, USA*

### About the Keynote Speaker

Dr. Richard R. Brooks got his BA from Johns Hopkins University in Mathematical Sciences and PhD in Computer Science from Louisiana State University. He was head of the Penn State ARL distributed systems department for 7 years and is now a professor of Computer Engineering at Clemson. Dr. Brooks’ network security research projects have included funding from NSF (analyzing denial of service), DoE (authentication and authorization), BMW Corporation (penetration testing), NIST (standards definition), AFOSR (timing side-channels) and the US State Department (creating anonymous communications tools). He finds attacks that disable security measures by working at a different level of the protocol stack. His Internet freedom work involves interactions with at risk populations working for freedom of expression. He has current work that looks at using the blockchain to secure meta-data, securing connected vehicles, and making the smart grid robust to attacks.

### Summary:

The blockchain data structure achieved notoriety with Satoshi’s Bitcoin proposal. This data structure integrated many existing technologies to create immutable distributed ledgers. This talk consists of three main sections:

First we explain how distributed ledgers work. This concentrates on the reliability and security attributes that they provide, how these attributes are guaranteed, and why the guarantees are sound.

We then explain attributes that are not provided by distributed ledgers currently, but are often mistakenly assumed. Many of these assumptions have resulted in inflated expectations for the technology that may harm further development. We also discuss aspects of current systems that are problematic and inefficient.

The final portion discusses some of the negative publicity that has been associated with blockchain by respected researchers. This is likely to be a reaction to some of the excessive promises and hype that has arisen.

The talk ends with a discussion of the existing technology along with the desirable extensions we are likely to see in the near future. This will include trying to estimate exactly where blockchain technologies are at the moment in Gartner’s hype cycle.
Dr James Irvine currently leads the communications and system integration theme of the Power Networks Demonstration Centre, part of the EEE Department at the University of Strathclyde in Glasgow, from where he obtained his PhD in 1994. His research focusses on mobile communication and security, in particular on resource allocation and coding theory.

He was active for many years in the UK Mobile VCE research programme, as Academic Co-ordinator of the ‘Instant Knowledge’ work area on privacy and trust in new personal communication services, and he led security work in the previous two MVCE Core programmes. His conference activities include General chair of VTC2015-Spring, TPC Chair of VTC2004-Spring, and TPC Co-chair of ISWCS2007. He is a co-author of two books and over 140 journal and conference papers. A co-author of seven patents, he has testified in the UK and the Netherlands on multiple cases involving cellular radio technology.

Dr. Irvine is a member of the IEEE Blockchain Initiative Steering Group, chairing the events activity. He is an elected Board member of the IEEE Vehicular Technology Society, and was President of the Society 2008-9 and founding Editor in Chief of the IEEE Vehicular Technology Magazine.

Summary:

Distributed ledger technology has the potential to transform a huge number of different areas, but that very diversity brings with it a challenge. Blockchain is sold as providing the answer, but if the needs of the intended application area are not well understood, this will only lead to disappointment.

One of the earliest examples of blockchain use outside of financial services is in energy trading. Traditional energy distribution networks relied on a hierarchical system of central generation, with transmission and then distribution networks to deliver energy to the customer. Renewal generation has changed all this, with local generation reversing supply and introducing highly variable demand.

The University of Strathclyde and its Power Network Demonstration Centre has been working on distributed ledger technologies to allow local energy trading, both within neighbourhoods on a micro scale, and also between areas to enhance resilience of a future smart grid. This talk will detail this work, and the related engineering challenges which have to be met to provide the ecosystem for the blockchain technologies to operate.

The IEEE has provided the first standards in the world addressing blockchain for energy, and through efforts like the BlockChain Initiative, is providing a means for research ideas to be carried through into industry applications. The talk will also discuss the Initiative and its work in other verticals, and how researchers can engage with it to increase the impact of their work.
Summit Keynotes Overview

IEEE Cybermatics Summit on Cyber Science and Engineering

Summit Keynotes
Stephen S. Yau, Arizona State University, USA
Jianhua Ma, Hosei University, Japan
Schahram Dustdar, TU Wien, Austria
Victor C.M. Leung, Shenzhen University, China
Parimala Thulasiraman, University of Manitoba, Canada

IEEE Cybermatics Summit on Blockchain: Advances, Challenges & Applications

Summit Keynotes
Zheng Yan, Xidian University, China & Aalto University, Finland
Ruppa K. Thulasiram, University of Manitoba, Canada
Stefan Schmid, University of Vienna, Austria
Hao Wang, Norwegian University of Science & Technology, Norway
The 2019 IEEE Cybermatics Summit on Cyber Science and Engineering

Time
Monday July 15, 17:10 - 18:30

Location
Capitol North

Summary
Cyber entities and Cyber-enabled worlds are forming and expanding into new fields named Cyber-X such as Cyber-Physical, Cyber-Social, Cyber-Mental, etc., which can be envisioned as essential multidisciplinary studies. Cybermatics is such a holistic field for the systematic study of cyber entities and cyber-enabled worlds. Cyberization is the process for conjugations of digital cyber entities with numerous entities in conventional worlds with a suite of cybermatic theories and technologies covering cyberspace, cybersecurity, cyberphysics, cyber intelligence, cyber life, etc. Cyber science and engineering are highly in demand in response to an ever-increasing diversity of synthesized cyber entities and connected cyber-enabled worlds. This Summit is to explore and discuss key research issues, technologies, challenges, and future directions of cyber science and engineering in cybermatics.

Chair
Stephen S. Yau, Arizona State University, USA

Summit Keynotes
❖ Jianhua Ma, Hosei University, Japan
❖ Schahram Dustdar, TU Wien, Austria
❖ Victor C.M. Leung, Shenzhen University, China
❖ Parimala Thulasiraman, University of Manitoba, Canada

Stephen S. Yau, Arizona State University, USA

Stephen S. Yau is Professor of Computer Science and Engineering at Arizona State University (ASU), Tempe, Arizona, USA. He served as the president of the IEEE Computer Society and was on the IEEE Board of Directors, and the Board of Directors of Computing Research Association. He served as the editor-in-chief of IEEE COMPUTER magazine. He organized many major conferences, including the 1989 World Computer Congress sponsored by the International Federation for Information Processing, and the IEEE Annual International Computer Software and Applications Conference (COMPSAC) sponsored by IEEE Computer Society. He was the general chair of the 2018 IEEE World Congress on Services. His current research includes cloud and services computing, cybersecurity, software engineering, ubiquitous computing and Internet-of-Things. He has received many awards, including the Tsutomu Kanai Award and Richard E. Merwin Award of the IEEE Computer Society, and the Outstanding Contributions Award of the Chinese Computer Federation. He is a Fellow of the IEEE and the American Association for the Advancement of Science.
Jianhua Ma, Hosei University, Japan

**Jianhua Ma** is a professor in the Faculty of Computer and Information Sciences, Hosei University, Tokyo, Japan. He served as the Chair of Digital Media Department of Hosei University in 2011-2012. His research interests include ubiquitous computing, social computing, wearable technology, IoT, smart things, and cyber intelligence. He has been devoted to the research on Hyper World and Cyber World (CW) since 1996. He first proposed Ubiquitous Intelligence (UI) towards Smart World (SW), which he envisioned in 2004, and was featured in the ID People Magazine in 2005. He has conducted several unique CW-related projects including the Cyber Individual (Cyber-I) to explore cyber life and individual-like intelligent artifacts. He has published more than 300 papers and delivered over 30 keynote speeches. He is a co-founder of three IEEE Congresses on ‘Smart World’, ‘Cybermatics’ and ‘Cyber Science and Technology’ as well as IEEE Conferences on Ubiquitous Intelligence and Computing (UIC), Pervasive Intelligence and Computing (PiCom), Advanced and Trusted Computing (ATC), Dependable, Autonomic and Secure Computing (DASC), Cyber Physical and Social Computing (CPSCcom), Internet of Things (iThings), and Internet of People (IoP). He is currently the chair of IEEE SMC Technical Committee on Cybermatics, and a founding chair of IEEE CIS Technical Committee on Smart World.

Schahram Dustdar, TU Wien, Austria

**Schahram Dustdar** is a Professor of Computer Science heading the Research Division of Distributed Systems at the TU Wien, Austria. He also holds several honorary positions: Monash University, Shanghai University, Macquarie University, and University of Groningen. From 1999 - 2007 he worked as the co-founder and chief scientist of Caramba Labs Software AG in Vienna (acquired by Engineering NetWorld AG), a venture capital co-funded software company focused on software for collaborative processes in teams. Caramba Labs was nominated for several (international and national) awards: World Technology Award in the category of Software (2001); Top-Startup companies in Austria (Cap Gemini Ernst & Young) (2002); MERCUR Innovation award of the Austrian Chamber of Commerce (2002). He is co-Editor-in-Chief of the ACM Transactions on Internet of Things (ACM TIoT) as well as Editor-in-Chief of Computing (Springer). He received the ACM Distinguished Scientist award (2009), the IBM Faculty Award (2012), a member of the Academia Europaea: The Academy of Europe as well as an IEEE Fellow.
Victor C.M. Leung, Shenzhen University, China

Victor C.M. Leung is a Distinguished Professor of Computer Science and Software Engineering at Shenzhen University, China. He was a Professor of Electrical and Computer Engineering and holder of the TELUS Mobility Research Chair at the University of British Columbia (UBC) when he retired from UBC at the end of 2018 and became a Professor Emeritus. His research is in the broad areas of wireless networks and mobile systems. He has co-authored more than 1200 journal/conference papers and book chapters. Dr. Leung is serving on the editorial boards of the IEEE Transactions on Green Communications and Networking, IEEE Transactions on Cloud Computing, IEEE Access, IEEE Network, and several other journals. He received the IEEE Vancouver Section Centennial Award, 2011 UBC Killam Research Prize, 2017 Canadian Award for Telecommunications Research, and 2018 IEEE TCGCC Distinguished Technical Achievement Recognition Award. He co-authored papers that won the 2017 IEEE ComSoc Fred W. Ellersick Prize, 2017 IEEE Systems Journal Best Paper Award, 2018 IEEE CSIM Best Journal Paper Award, and 2019 IEEE TCGCC Best Journal Paper Award. He is a Fellow of IEEE, the Royal Society of Canada, Canadian Academy of Engineering, and Engineering Institute of Canada.

Parimala Thulasiraman, University of Manitoba, Canada

Parimala Thulasiraman is a Professor with the Department of Computer Science at the University of Manitoba. Her research interests are in the intersection of high performance parallel/distributing computing and graph analytics for real world applications in network science. Her laboratory, Inter-Disciplinary Evolving Algorithmic Sciences (IDEAS), applies innovative soft computing techniques such as evolutionary computation, bio-inspired computation, and machine learning to solve challenging issues in complex network systems and data scientific problems. She explores novel algorithmic optimization techniques for these problems to efficiently map, design, and develop scalable algorithms for futuristic multicore architectures. She has supervised and graduated over 100 students, and has published over 150 papers in conferences, such as IEEE International Parallel and Distributed Symposium, journals, such as the Journal of Parallel and Distributed Computing, a book and several book chapters. She has received best paper awards in leading high performance computing conferences. Her research is supported by the Natural Sciences and Engineering Research Council of Canada as well as other local grants. She has organized many conferences as local chair, program chair, and tutorial chair. She is a member and senior member of the ACM and IEEE, respectively.
The 2019 IEEE Cybermatics Summit on Blockchain: Advances, Challenges & Applications

Time
Wednesday July 16, 17:00 – 18:30

Location
Capitol North

Summary
Blockchain is a promising technology for decentralization in order to avoid full dependence on a single trusted party in cyber space. Currently, blockchain has attracted intensive attention from not only financial institutions and capital markets, but also governments and other industrial fields due to its disintermediation, transparency, tamper-resilience, collective maintenance, programmability, and immutability. Inspired by Bitcoin, blockchain has been eagerly researched for providing decentralized security solutions in the fields of cryptocurrencies, Internet of Things, cloud computing, data management, healthcare, shared economy, etc. However, applications based on blockchain are still in their infancy although it holds a number of advantages. Existing blockchain-based applications suffer from several drawbacks, such as high resource consumption, low efficiency, low scalability, fork problem, etc., which greatly constrain their wide usage. In this panel, advances, challenges, and applications of blockchain will be discussed. Each anellist will give an opening presentation of his/her point of view, and the discussion will be open to the floor.

Summit Keynotes
◊ Zheng Yan, Xidian University, China & Aalto University, Finland
◊ Ruppa K. Thulasiram, University of Manitoba, Canada
◊ Stefan Schmid, University of Vienna, Austria
◊ Hao Wang, Norwegian University of Science & Technology, Norway

Zheng Yan, Xidian University, China & Aalto University, Finland

Zheng Yan is a professor in the School of Cyber Engineering, Xidian University, China and a visiting professor and Finnish Academy research fellow at the Aalto University, Finland. She received the DSc in Technology from the Helsinki University of Technology, Finland. Before joining academia in 2011, she was a senior researcher at the Nokia Research Center, Helsinki, Finland, since 2000. Her research interests are in trust, security, privacy, and security-related data analytics. She is an inventor of 24 patents and 45 PCT patents, all of them having been adopted in industry. She is an area editor of Information Fusion, an associate editor of IEEE Internet of Things Journal, Information Sciences, JNCA and IEEE Access. She served as a general chair or program chair for numerous international conferences. She is a founder steering committee co-chair of IEEE Blockchain conference. She recently received several awards, including the 2017 Best Journal Paper Award issued by IEEE Communication Society Technical Committee on Big Data and the Outstanding Associate Editor of 2017/2018 for IEEE Access.
Ruppa K. Thulasiram, University of Manitoba, Canada

Ruppa K. Thulasiram (Tulsi) is a Professor with the Department of Computer Science, University of Manitoba, Winnipeg, Manitoba. He received his Ph.D., from Indian Institute of Science, Bangalore, India and spent years at Concordia University, Montreal, Canada; Georgia Institute of Technology, Atlanta; and University of Delaware as Post-doc, Research Staff and Research Faculty respectively before taking up a position at University of Manitoba. Tulsi’s current research interests include Computational Finance, Cloud Computing, FinTech (Blockchain technology for Financial and other Trading) and related areas focusing on Derivative Pricing Algorithms, Investment Optimization, Task Matching in Grid/Cloud Systems, Resource Pricing in Cloud. He has written about two hundred papers in the areas of High Temperature Physics, Gas Dynamics, Computational Finance, Grid/Cloud computing, and ad hoc networks research areas in prestigious journals and conferences. He has received many best paper awards at conferences and most cited paper recognition in journals. He has delivered many keynote and invited talks at conferences and special events. He has supervised many MSc and PhD theses and graduated many students. He holds a patent for true random generators along with students. His research has been continuously funded by the Natural Sciences and Engineering Research Council of Canada and by other funding opportunities.

Tulsi has developed a curriculum for cross-disciplinary computational finance as well as Cloud computing courses at University of Manitoba for both graduate & senior undergraduate levels and has been teaching them for the past several years. Also, he has been involved in the development of Business Analytics program at University of Manitoba. Tulsi has been an associate editor of the IEEE Transactions on Cloud Computing and has been guest editor for journals such as Elsevier Parallel Computing, Wiley Concurrency and Computation – Practice and Experience etc. He has organized many IEEE/ACM conferences especially in Computational Finance and Computational Intelligence in Finance. He is associated with many professional societies and technical committees of IEEE, ACM, ASAC etc. and is a senior member of IEEE.

Stefan Schmid, University of Vienna, Austria

Stefan Schmid is a Professor at the Faculty of Computer Science, at University of Vienna, Austria. He obtained his diploma (MSc) in Computer Science at ETH Zurich in Switzerland (minor: micro/macro economics, internship: CERN) and did his PhD in the Distributed Computing Group led by Prof. Roger Wattenhofer, also at ETH Zurich. As a postdoc, he worked with Prof. Christian Scheideler at the Chair for Efficient Algorithms at the Technical University of Munich and at the Chair for Theory of Distributed Systems at the University of Paderborn, in Germany. From 2009 to 2015, Stefan Schmid was a senior research scientist at the Telekom Innovation Laboratories (T-Labs) and at TU Berlin in Germany (Internet Network Architectures group headed by Prof. Anja Feldmann). In 2013/14, he was an INP Visiting Professor at CNRS (LAAS), Toulouse, France, and in 2014, a Visiting Professor at Université Catholique de Louvain (UCL), Louvain-la-Neuve, Belgium. From 2015 to 2017, Stefan Schmid was a (tenured) Associate Professor in the Distributed, Embedded and Intelligent Systems group at Aalborg University, Denmark, and continued working part-time at TU Berlin, Germany. Since 2015, he serves as the Editor of the Distributed Computing Column of the Bulletin of the European Association of Theoretical Computer Science (BEATCS), since 2016 as Associate Editor of IEEE Transactions on Network and Service Management (TNSM), and since 2019 as Editor of IEEE/ACM Transactions on Networking (ToN). Stefan Schmid received the IEEE Communications Society ITC Early Career Award 2016. His research interests revolve around the fundamental and algorithmic problems of networked and distributed systems.
Hao Wang is an associate professor in the Department of Computer Science in Norwegian University of Science & Technology, Norway. He has a Ph.D. degree and a B.Eng. degree, both in computer science and engineering, from South China University of Technology. His research interests include blockchain, big data analytics, industrial IoT, and safety-critical systems. He has published 100+ papers in reputable international journals and conferences. He served as a TPC co-chair for IEEE DataCom 2015, IEEE CIT 2017, ES 2017, a senior TPC member for CIKM 2019, and reviewers for prestigious journals such as IEEE TKDE, TII, TBD, TETC, T-IIFS, IoTJ, TCSS, and ACM TOMM, TIST. He is a member of IEEE IES Technical Committee on Industrial Informatics.
The iThings 2019 Technical Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00-16:00</td>
<td>Registration</td>
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<tr>
<td>18:00-20:30</td>
<td>Reception</td>
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## The iThings 2019 Technical Program

### Monday July 15, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td>08:00-16:00</td>
<td>Registration</td>
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<tr>
<td>09:00-09:40</td>
<td>Opening</td>
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<tr>
<td>09:40-10:40</td>
<td>Keynote 1: S. S. Iyengar (Chaired by Stephen Yau)</td>
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<tr>
<td>10:40-11:10</td>
<td>Coffee Break</td>
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<tr>
<td>11:10-12:30</td>
<td>iThings-1 (Georgia 4) iThings-2 (Georgia 5)</td>
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<td>12:30-13:30</td>
<td>Lunch</td>
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<tr>
<td>13:30-14:50</td>
<td>iThings-3 (Georgia 4) iThings-4 (Georgia 5)</td>
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<td>14:50-15:20</td>
<td>Coffee Break</td>
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<tr>
<td>15:20-17:00</td>
<td>iThings-5 (Georgia 4)</td>
</tr>
<tr>
<td>17:10-18:30</td>
<td>IEEE Cybermatics Summit on Cyber Science and Engineering</td>
</tr>
</tbody>
</table>

### iThings-1: IoT Enabling Technology (I)
**Session Chair: Ashwin Ashok, Georgia State University**

1. Beacon Node Placement for Minimal Localization Error  
   **Zimu Yuan; Wei Li; Shuhui Yang**
2. The Research of Intelligent Fault Diagnosis System Based on Internet of Things  
   **Yingli Wen**
3. A Dual-buffer Based Congestion Control Algorithm for Wireless Multimedia Sensor Networks  
   **Nasim Abbas; Fengqi Yu**
4. Enabling CoAP-Based Communication Across Network Boundaries: Challenges and Solutions  
   **Oscar Novo**

### iThings-2: IoT Networks and Communications (I)
**Session Chair: Anu G. Bourgeois, Georgia State University**

1. Identifying and Allocating Resources During Out of Hospital Cardiac Arrest  
   **Vijay Mago; Gaurav Rao; David Savage; Rory Beyer**
2. Energy-Efficient Routing for Greenhouse Monitoring using Heterogeneous Sensor Networks  
   **Mohammad S Khan; Sushanta Kumar Mohapatra; Trupti Mayee Behera; Umesh Chandra Samal; Md Zakirul Alam Bhuiyan**
3. Progressive Search Algorithm for Service Discovery in an IoT Ecosystem  
   **Santosh Pattar; Dwaraka S Kulkarni; Darshil Yala; Rajkumar Buyya; Venugopal K r; Sitharama Iyengar; Lalit Patnaik**
4. Distributed Semantic Reasoning enabled by Fog Computing  
   **Yu Hsiang Chien; Fuchun Joseph Lin**

### iThings-3: IoT Services and Intelligence (I)
**Session Chair: Lingzhi Yi, St. Francis Xavier University**

1. A Multi-Authority Attribute-Based Signcryption Scheme with Efficient Revocation for Smart Grid Downlink Communication  
   **Ahmad Alsharif; Ahmed Shafee; Mahmoud Nabil; Mohamed M E A Mahmoud; Waleed Alasmary**
2. Rethinking IoT Network Reliability in the Era of Machine Learning  
   **Xenofon Fafoutis; Letizia Marchegiani**
3. On the Case of Privacy in IoT ecosystem: A Survey  
   **Sana Intizaz; Ramin Sadre; Vladimir Vlassov**
4. Design of VDES Ground Subsystem Based on Filtered Multitone Modulation  
   **Xu Wang; Minghua Wang; Lingzhi Yi; Yan Wang**
**iThings-4: IoT Systems (I)**

**Session Chair: Minghua Wang, University of South China**

1. CoAP and MQTT based Models to deliver Software and Security Updates to IoT Devices Over the Air
   *Anurag Thantharate; Cory Beard; Poonam Kankariya*
2. Low-Latency CoAP Processing in FPGA for the Internet of Things
   *Lucas R. B. Brasilino; Martin Swany*
3. Enabling Container-based Fog Computing with OpenStack
   *Zakaria Benomar; Francesco Longo; Giovanni Merlino; Antonio Puliafito*

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**iThings-5: IoT Smart Applications (I)**

**Session Chair: Minghua Wang, University of South China**

1. Hybrid Robot-as-a-Service (RaaS) Platform (Using MQTT and CoAP)
   *Pritesh C. Bhavsar; Sarosh Patel; Tarek Sobh*
2. A Dynamic Traffic Awareness System for Urban Driving
   *Ziyue Wang; Parimala Thulasiraman; Ruppa K. Thulasiram*
3. Scalable IoT/M2M Platforms based on Kubernetes-enabled NFV MANO Architecture
   *Hung-Li Chen; Fuchun Joseph Lin*
4. Efficient Image Transmission Using LoRa Technology In Agricultural Monitoring IoT Systems
   *Tonghao Chen; Derek Eager; Dwight Makaroff*
The iThings 2019 Technical Program

Tuesday July 16, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00-16:00</td>
<td>Registration</td>
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<tr>
<td>09:00-10:00</td>
<td>Keynote 2: Schahram Dustdar (Chaired by Laurance Yang)</td>
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<tr>
<td>10:00-11:00</td>
<td>Keynote 3: Richard Brooks (Chaired by Raj Sunderraman)</td>
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<td>11:00-11:20</td>
<td>Coffee Break</td>
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<td>11:20-12:40</td>
<td>iThings-6 (Georgia 4)</td>
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<td>12:40-13:40</td>
<td>Lunch</td>
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<td>13:40-15:00</td>
<td>iThings-8 (Georgia 4)</td>
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<td>15:00-15:20</td>
<td>Coffee Break</td>
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<tr>
<td>15:20-16:20</td>
<td>iThings-10 (Georgia 4)</td>
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<tr>
<td>17:00-18:30</td>
<td>IEEE Cybermatics Summit on Blockchain: Advances, Challenges &amp; Applications</td>
</tr>
<tr>
<td>19:00-21:30</td>
<td>Banquet</td>
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**iThings-6: IoT Enabling Technology (II)**
Session Chair: Minghua Wang, University of South China

1. M-DB: A Continuous Data Processing and Monitoring Framework for IoT Applications  
   Vaibhav Arora; Mohammad Javad Amiri; Divyakant Agrawal; Amr El Abbadi
2. Structural Influence Maximization in Social Networks  
   Dong Jing
3. Low-cost Wearable Gesture Recognition System with Minimal User Calibration for ASL  
   Syed Ahmed; Gokul H; Prithvi Suresh; Vineeth Vijayaraghavan
4. Sensor-Chain: A Lightweight Scalable Blockchain Framework for Internet of Things  
   Abdur Rahman Bin Shahid; Corey Staier; Rain Kwan; Niki Pissinou

**iThings-7: IoT Networks and Communications (II)**
Session Chair: Xianjun Deng, St.Francis Xavier University

1. Deep Recurrent Electricity Theft Detection in AMI Networks with Evolutionary Hyper-parameter Tuning  
   Mahmoud Nabil; Mohammad Ismail; Mohamed M E A Mahmoud; Erchin Serpedin
2. Gateway Planning for Hybrid LoRa Networks  
   Tao Zhou; Yuyi Sun; Shibo He; Zhiguo Shi; Jiming Chen; Zhen Tao
3. Guideline-based Approach for IoT Home Application Development  
   Reza M. Parizi; Norizan A Kamaludeen; Sai Peck Lee
4. Sensor Based Dynamic Hand Gesture Recognition by PairNet  
   Wen-Jyi Hwang; Yun-Jie Jhang; Yen-Cheng Chu; Tsung-Ming Tai; Po-Wen Cheng; Cheng-Kuang Lee

**iThings-8: IoT Services and Intelligence (II)**
Session Chair: Lingzhi Yi, St. Francis Xavier University

1. Complex Patterns of Failure: Fault Tolerance via Complex Event Processing for IoT Systems  
   Alexander Power; Gerald Kotonya
2. Analytical Modeling of Resource Allocation for Real time Traffic in Cognitive Radio Internet of Things  
   Fazlullah Khan
3. SDN/NFV-based Network Infrastructure for Enhancing IoT Gateways  
   Do Sinh; Luong Vy Le; Bao-Shuh Lin; Li-Ping Tung
4. Evaluation of Precalibrated Electrochemical Gas Sensors for Air Quality Monitoring Systems  
   Saeed Faisal Malky; Ivica N. Kostanic; Khalid A Altheiab; Waleed Alharbai
iThings-9: IoT Systems (II)
Session Chair: Minghua Wang, University of South China
1. A Performance Comparison of Routing Protocols for Tramcars in Mining Industry
   Weiguo Ding; Rui Xu; Banggui Xu; Changliang Xiao; Liang Zhao
2. IoT-enabled Ambulances Assisting Citizens’ Well-being after Earthquake Disasters in Smart Cities
   Klimis Ntalianis; Theodoros Vasileios Anagnostopoulos; Nicolas Tsapatsoulis
3. A Hardware-Software Codesign Approach to Identity, Trust, and Resilience for IoT/CPS at Scale
   Farah Kandah; Donald R Reising; Anthony Skjellum; Amani Altarawneh; Joseph Cancelleri
4. Cyber Physical IoT Device Management Using a Lightweight Agent
   Matt Maloney; Elizabeth Reilly; Michael Siegel; Gregory Falco

iThings-10: IoT Smart Applications (II)
Session Chair: Minghua Wang, University of South China
1. Authentication Protocol for Real-time Wearable Medical Sensor Networks using Biometrics and Continuous Monitoring
   Nada Radwan Mohsen; Bidi Ying; Amiya Nayak
2. Security Automation for Cloud-Based IoT Platforms
   Mheni Merzouki; Robert Bohn; Cihan Tunc
   Mohamed Issam Ayadi; Abderrahim Maizate; Mohamed Ouzzif
<table>
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<tr>
<td>09:00-10:00</td>
<td>Keynote 4: Mohammed Atiquzzaman (Chaired by Zheng Yan)</td>
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<tr>
<td>10:00-11:00</td>
<td>Keynote 5: James Irvine (Chaired by Anu Bourgeois)</td>
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<td>Lunch</td>
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# The GreenCom 2019 Technical Program

## Sunday July 14, 2019

<table>
<thead>
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The GreenCom 2019 Technical Program

Monday July 15, 2019

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<td>Keynote 1: S. S. Iyengar (Chaired by Stephen Yau)</td>
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<td>11:10-12:30</td>
<td>GreenCom-1 (Atlanta 4)</td>
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<tr>
<td>12:30-13:30</td>
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<td>15:20-16:40</td>
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<tr>
<td>17:10-18:30</td>
<td>IEEE Cybermatics Summit on Cyber Science and Engineering</td>
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**GreenCom-1: Optimization and Analysis in GreenCom**

Session Chair: Ziqian (Cecilia) Dong, New York Institute of Technology

1. Experimental Characterization of Variation in Power Consumption for Processors of Different generations  
   Yewan Wang; David Nortershauser; Stephane Le Masson; Jean-Marc Menaud
2. Execution Units Power-Gating to Improve Energy Efficiency of GPGPUs  
   Xin Wang; Wei Zhang
3. A Workflow Scheduling Deadline-based Heuristic for Energy Optimization in Cloud  
   Emile Cadorel; Helene Coulon; Jean-Marc Menaud
4. Delayed Best-Fit Task Scheduling to Reduce Energy Consumption in Cloud Data Centers  
   Ziqian (Cecilia) Dong; Wenjie Zhuang; Roberto Rojas-Cessa

**GreenCom-2: Green Communications and Networking (I)**

Session Chair: Shuhui Yang, Purdue University, Northwest

1. Routing and Working Topology Assignment for Energy Efficient Fibbing-Controlled IP Networks  
   Steven S. W. Lee; Kuang-Yi Li; Saeed Barkabi
2. An Energy-Aware Sleeping Mechanism in Cache-Enabled Heterogeneous Small Cell Networks  
   Yazhou wang; Heli Zhang; Hong Ji; Xi Li
3. Energy-Efficient Resource Allocation with Flexible Frame Structure for Heterogeneous Services  
   Wenshu Sui; Xiaojing Chen; Shuqing Zhang; Zhiyuan Jiang; Shugong Xu
4. Optimal Connected Cruise Control Design with Stochastic Communication Delays  
   Zhuwei Wang; Yu Gao; Chao Fang; Changqing Luo; Siqin You

**GreenCom-3: Smart Grid**

Session Chair: Shuhui Yang, Purdue University, Northwest

1. Greedy Algorithm for Routing Power and Source Assignment on a Digital Microgrid  
   Zhengqi Jiang; Vinitmadhukar Sahasrabudhe; Haim Grebel; Ahmed Mohamed; Roberto Rojas-Cessa
2. CSPowerR-Watch: A Cyber-resilient Residential Power Management System  
   Faraz A. Nuseem; Leonardo Babun; Cengiz Kaygusuz; S. Joe Moquin; Chris Farnell; Mantooth Alan; Selcuk Uluagac
3. Neural Network Architectures for Electricity Consumption Forecasting  
   Cristina Heghedus; Santiago Segarra; Antorweep Chakravorty; Chunming Rong
4. Short-term Load Forecasting with LSTM based Ensemble Learning  
   Lingxiao Wang; Shiwen Mao; Bogdan Wilamowski
The GreenCom 2019 Technical Program

Tuesday July 16, 2019

<table>
<thead>
<tr>
<th>Time</th>
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<tr>
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<td>10:00-11:00</td>
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<td>16:40-17:40</td>
<td>GreenCom-8 (Room: Atlanta 4)</td>
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<td>17:00-18:30</td>
<td>IEEE Cybermatics Summit on Blockchain: Advances, Challenges &amp; Applications</td>
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<tr>
<td>19:00-21:30</td>
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GreenCom-4: Green Communications and Networking (II)
Session Chair: Changqing Luo, Virginia Commonwealth University

1. Dynamic Service Selection in Backscatter-Assisted RF-Powered Cognitive Networks: An Evolutionary Game Approach
   Xiaozheng Gao; Shaohan Feng; Dusit Niyato; Kai Yang
2. Q-Learning Based Energy Harvesting for Heterogeneous Statistical QoS Provisioning over Multiple Big-Data Relay Networks
   Xi Zhang; Jingqing Wang; Qixuan Zhu
3. Joint Service Pricing and Cooperative Relay Communication for Federated Learning
   Shaohan Feng; Dusit Niyato; Ping Wang; Dong In Kim; Ying-Chang Liang
4. TSGO: Exploiting Medium Collaboration for Green Edge
   Dapeng Wu; Boran Yang; Hongang Wang; Yishuang Gao; Ruyan Wang

GreenCom-5: Green Society Applications (I)
Session Chair: Ashwin Ashok, Georgia State University

1. A LSTM-Based Smart PM2.5 Detecting and Forecasting System using LoRa
   Jinkun Han; Wei Song; Yanning Gao; Junwei Xie
2. Cascade Morphological n-gram can Improve Chinese Words Representation Learning
   Haobo Yang; Zongyang Xiong; Jiexin Zhang; Qin Ke; Guoming Lu
3. Three-dimensional Simulation for Training Autonomous Vehicles in Smart City Environments
   Phuong Chu; Mingyun Wen; Jisun Park; Kaisi Huang; Kyungyun Cho
4. A Behavior Recognition Framework based on Skeleton Spatio-Temporal Relation
   Lizong Zhang; Min Guo; Tingting Wu; Guoming Lu

GreenCom-6: Green Technologies for 5G
Session Chair: Ashwin Ashok, Georgia State University

1. LRA-3C: Learning Based Resource Allocation for Communication-Computing-Caching Systems
   Ge Wang; Li Wang; Jianbin Chuan; Wenjing Xie; Aiguo Fei; Hongming Zhang
2. User Satisfaction-Aware Resource Allocation for 5G Green Vehicle Platooning
   Rui Geng; Huiying Ren; Junjie Yan
3. Mobile Device Training Strategies in Federated Learning: An Evolutionary Game Approach
   Yue Zou; Shaohan Feng; Dusit Niyato; Yu Tao Jiao; Shimin Gong; Wenqing Cheng
4. Toward Software Defined Dynamic Defense as A Service for 5G-Enabled Vehicular Networks
   Haotian Xu; Mianxiong Dong; Kaoru Ota; Jun Wu; Jianhua Li
GreenCom-7: Green Society Applications (II)
Session Chair: Roja Eini, Virginia Commonwealth University
1. An Improved Active Incremental Fine-tuning Method using Outlier Detection based on the Normal Distribution
   Guiduo Duan; Zipeng Wang; Lin Sun; Guangchun Luo; Guoming Lu
2. A LoRa Posture Recognition System Based on Multi-source Information Fusion
   Jinkun Han; Wei Song
3. Towards a Data-Driven Symbiosis of Agriculture and Photovoltaics
   Mingxin Wang; Yiqiang Zhang; Jian Sun; Wei Li; Albert Zomaya; Yajie Sun
4. Distributed Model Predictive Control for Intelligent Traffic System
   Roja Eini; Sherif Abdelwahed

GreenCom-8: Green Society Applications (III)
Session Chair: Changqing Luo, Virginia Commonwealth University
1. Multimodal Deep Learning for Solar Irradiance Prediction
   Zhuo Li; Kejie Wang; Chenchen Li; Miao Zhao; Jiannong Cao
2. Architecture and Algorithm for IoT Autonomic Network Management
   Luis Eduardo; Villela Zavala; Alfonso Ordones Garcia; Mario Siller
3. A 3D Hough Transform Algorithm for Ground Surface Extraction from LiDAR Point Clouds
   Jinkun Han; Wei Song
# The GreenCom 2019 Technical Program

## Wednesday July 17, 2019

<table>
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<th>Time</th>
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<td>09:00-10:00</td>
<td>Keynote 4: Mohammed Atiquzzaman (Chaired by Zheng Yan)</td>
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<td>10:00-11:00</td>
<td>Keynote 5: James Irvine (Chaired by Anu Bourgeois)</td>
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# The CPSCom 2019 Technical Program

## Sunday July 14, 2019

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The CPSCCom 2019 Technical Program

### Monday July 15, 2019

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<td>CPSCCom-1 (Georgia 6)</td>
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<td>13:30-14:50</td>
<td>CPSCom-2 (Georgia 6)</td>
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<tr>
<td>15:20-17:00</td>
<td>CPSCom-3 (Georgia 6)</td>
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<td>17:10-18:30</td>
<td>IEEE Cybermatics Summit on Cyber Science and Engineering</td>
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</table>

### CPSCCom-1: CPSS Data and Services (I)
**Session Chair: Hao Wang, Norwegian University of Science and Technology**

   *Antonino Galletta, Javid Taheri, Massimo Villari*
2. Integrated Modeling of Personal Character Using Personal Big Data  
   *Ao Guo, Jianhua Ma, Kevin I-Kai Wang*
3. Terahertz Image Super-resolution Reconstruction of Passive Safety Inspection based on Generative Adversarial Network  
   *Wan Yibin, Rongyue Zhang, Xiao Hong, Hao Wang, Yihao Pan, Yubin Zhou*
   *Eduard Schleicher, Kalman Graffi, Ahmad Rabay'a*

### CPSCCom-2: CPSS Data and Services (II)
**Session Chair: Yunpeng Zhang, University of Houston**

1. Personal Affective Trait Computing Using Multiple Data Sources  
   *Shunxiang Tan, Ao Guo, Jianhua Ma, Shengbing Ren*
2. Multi-Scale Feature Pair Based R-CNN Method for Defect Detection  
   *Zihao Huang, Hong Xiao, RongYue Zhang, Hao Wang, Cheng Zhang, Xiucong Shi*
   *Yunpeng Zhang*
4. Portable Convolution Neural Networks for Traffic Sign Recognition in Transportation Cyber-Physical Social Systems  
   *Junhao Zhou, Hong-Ning Dai, Hao Wang*

### CPSCCom-3: CPSS Systems and Design
**Session Chair: Houbing Song, Embry-Riddle Aeronautical University**

1. Uncertainty Theory Based Reliability-Centric Cyber-Physical System Design  
   *Yu Jiang, Mingzhe Wang, Xun Jiao, Houbing Song, Hui Kong, Rui Wang, Yongxin Liu, Jian Wang, Jiaguang Sun*
2. An Efficient and Dependable FOTA-Based Upgrade Mechanism for In-Vehicle Systems  
   *Zhenjiang Wang, Jian-Jun Han, Tianpeng Miao*
   *Perm Soonsawad, Kang Eun Jeon, James She, Ching Hong Lam, Pai Chet Ng*
4. The Implementation of a Power Efficient BCNN-based Object Detection Acceleration on a Xilinx FPGA-SoC  
   *Heekyung Kim, Ken Choi*
5. A FrameBuffer Oriented Graphical Human-Machine Interaction Mechanism for Intelligent In-Vehicle Systems  
   *Zhenjiang Wang, Jian-Jun Han, Tianpeng Miao*
1. The Complex Network Model for Industrial Data Based on Spearman Correlation Coefficient
   Chao Meng, Xuesong Jiang, Jian Wang, Xiumei Wei

2. A Dynamic Health Assessment Method for Industrial Equipment Based on SG-FCM Clustering algorithm
   Yubin Zhou, Hong Xiao, Zhigang Chen, Tao Wang, Yihao Pan, Wan Yibin

3. Prediction Model of Desulfurization Efficiency of Coal-fired Power Plants based on Long Short-term Memory Neural Network
   Jigao Fu, Hong Xiao, Tao Wang, RongYue Zhang, Limiao Wang, Xiucong Shi

   Zhen Ni, Qianmu Li, Ting Li

5. A Multi-Objective Computation Offloading Method for Workflow Applications in Mobile Edge Computing
   Xiaoping Zhao, Jiaxin Wu, Yonghong Zhang, Lihua Wang

6. Privacy-Aware Data Offloading for Mobile Devices in Edge Computing
   Xiaolong Xu, Bowei Tang, Gaoxing Jiang, Xihua Liu, Yuan Xue, Yuan Yuan

7. License Plate Character Segmentation Algorithm in Intelligent Visual IoT Visual Label
   Honglin Xie

   Zhaoquan Gu, Yuexuan Wang, Keke Tang, Chao Li, Mohan Li, Lihua Yin

   Xihua Liu, Xiaolong Xu, Yuan Yuan, Xuyun Zhang, Wanchun Dou

10. A Range Search Scheme Based on Encrypted Index Hiding Order and Access Patterns
    Baohua Huang, Sheng Liang

11. Task Scheduling Approach to Save Energy of Heterogeneous Computing Systems
    Junke Li, Mingjiang Li, Guangyu Wang, Jincheng Zhou, Degaung Li

12. Resource Scaling in Elastic Clusters with the Hint of Response Time
    Cheng Hu

13. A new Approach based on Parallel Probabilistic to Factorize a Semiprime
    Jianhui Li

    Degaung Li, Ruiling Zhang, Shijie Jia, Yanling Jin, Youzhong Ma, Junke Li

15. An Improved Dynamic Power Management Approach by Process Migration for Muti-core Systems
    Degaung Li, Ruiling Zhang, Shijie Jia, Yanling Jin, Youzhong Ma, Junke Li

16. Motion Estimation Approach using Bidirectional Two-Layer LSTMs
    Haitao Guo, YunSick Sung, Jungho Kang

17. Co-occurrence Morphological Edge Detection
    Heng Yu, Cong Yu, Hongya Zhao, Lizhen Deng, Lei Wang

18. Special Robot Vision Algorithm Test Platform In Virtual Reality Environment
    Yong Wang, Peng Tian, Yu Zhou, Wang Li

19. Computing Symmetric Brothers of a Node in a Perfect Binary Tree
    Xingbo Wang, Zhen Shen

20. Dynamic Gesture Recognition Method based on Convolutional Neural Network
    Xiaoyu Xu, Qingmin Meng, Lizhen Deng
1. Wavelet Transformation of Functional data for Hyperspectral Image Classification  
   Guangrun Xiao, Dezheng Liu
2. Image Threshold Segmentation based on GLLE Histrogram  
   Chunming He, Lizhen Deng, Jiajia Xu, Xiaoobo Wang
3. Behavior Analysis of Indoor Escape Route-finding Based on Head-mounted VR and Eye Tracking  
   Peng Tian, Yunjia Wang, Yunhong Zhang, Yong Wang, Xuehua Wu, Derong Hai
4. Student Gesture Recognition based on Multiple Features  
   Lei Fen, Yantao Wei, Jiamin Hu, Huang Yao, Wei Deng
5. A Stochastic Virtual Machine Placement Algorithm for Energy-Efficient Cyber-Physical Cloud Systems  
   Shi Yan, Yi Zhang, Shuyin Tao, Xin Li, Jin Sun
6. Power-Aware Virtual Machine Placement for Mobile Edge Computing  
   Yuxin Sun, Xianzhang Chen, Duo Liu, Yiju Tan
7. A Novel ECG Heartbeat Classification Approach Based on Compressive Sensing in Wearable Health Monitoring System  
   Jing Hu, Jianjun Tang, Jizhong Liu, Fuhao Yang, Wenmeng Zhu
8. Integrating Cyber Physical Social Systems with Agricultural Supply Chain Systems: A New Paradigm for Social Fairness  
   Indra Eluubeck kyzy, Ahmadreza Vajdi, Huaming Song, Yongli Wang, Nurzada Bobukeeva
9. A Framework to Solve the Energy, Makespan and Lifetime Problems in Reliability-driven Task Scheduling  
   Junlong Zhou, Kun Cao, Jin Sun, Yi Zhang, Tongquan Wei
10. A Design of Encoding Arbitration and Interrupt Request for Dynamic Reconfigurable High-speed Serial Bus in Cyber Physical System  
    Yixiao Liu, Weigong Zhang, Ji Qin Zhou, Ying Wang, Shan Wang, Lin Zhang
11. A New Proposed Sensor Cloud Architecture Based on Fog Computing for Internet of Things  
    Xuejiang Wei, Libing Wu
12. L-RBF: A Customer Churn Prediction Model Based on Lasso+RBF  
    Anping Xiong, Ya You, Linbo Long
13. Privacy Preserving Computations over Healthcare Data  
    Qi Wang, Dehua Zhou, Shiyin Yang, Peng Li, Chuansheng Wang, Guanlong Guan
    Menglong Li
15. A Structured Method for Breast Ultrasound Report Based on Semantic Tree  
    Dehua Chen, Shujun Liu, Weimin Li
16. Differentially Private Recommender System with Autoencoders  
    Xiaoping Liu, Qianmu Li, Zhen Ni
17. An Efficient Storage Service Method for Multidimensional Meteorological Data in Cloud Environment  
    Ming Yang, Xiaolong Xu, Wenchun He, Zhiquiang Zhang, Yongjun Xu, Yufeng Chen
18. A Quantum Feature Selection Algorithm for Multi-Classification Problem  
    Junxiu Chen, Wenjie Liu, Peipei Gao, Haibin Wang
19. Consistency Verification Between Collaborative Business Processes and Requirements  
    Qi Mo, Fei Dai, Tong Li
20. A Multi-objective Diagnosis Method for Gearbox: Multi Task Deep Learning based on One-dimensional Convolution  
    Xiaoping Zhao, Jiaxin Wu
# The CPSCom 2019 Technical Program

**Tuesday July 16, 2019**

<table>
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<td>11:20-12:40</td>
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<td>CPSCom-5 (Georgia 2)</td>
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<td>17:00-18:30</td>
<td>IEEE Cybermatics Summit on Blockchain: Advances, Challenges &amp; Applications</td>
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<td>Banquet</td>
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## CPSCom-4: CPSS Technologies and Applications (I)
**Session Chair: Jianwen Xu, Muroran Institute of Technology**

1. LUNA: Lightweight UAV Navigation Based on Airborne Vision for Disaster Management  
   *Jianwen Xu, Kaoru Ota, Mianxiong Dong*
2. Non-invasive and Quick Respiratory-Rate Monitoring at Bedtime Using Passive RFIDs  
   *Kagome Naya, Xiaoxuan Hu, Toshiaki Miyazaki, Peng Li, Kun Wang*
3. Robustness of Basal Heart Rate against Declining Physical Activity: Analysis of Physiological Big Data  
   *Emi Yuda, Yutaka Yoshida, Masaya Kisohara, Junichiro Hayano*
4. Smart Stick for Elderly  
   *Lakshmi Boppana, Vishal Jain, Ravi Kishore*

## CPSCom-5: CPSS Network and Communications (I)
**Session Chair: Hao Wang, Norwegian University of Science and Technology**

1. Congestion Control for Epidemic Routing in Opportunistic Networks  
   *Raphael Bialon, Kalman Graffi*
2. Improving Message Delivery in Opportunistic Networks with Fragmentation and Network Coding  
   *Raphael Bialon, Jan Tölkes, Kalman Graffi*
3. Nation Scale Mobile Ad Hoc Network for Normally Isolated  
   *Sean Oesch, Max Schuchard*
4. IoT-based Urban Traffic-Light Control: Modelling, Prototyping and Evaluation of MQTT protocol  
   *Rafik Zitoun, Jérémy Petit, Aghiles Djoudi, Laurent George*

## CPSCom-6: CPSS Technologies and Applications (II)
**Session Chair: Emi Yuda, Tohoku University**

1. Assistive Sign Language Coverter for Deaf and Dumb  
   *Lakshmi Boppana*
2. Arabic Cyberbullying Detection: Enhancing Performance by Using Ensemble Machine Learning  
   *Batoul Haidar, Maroun Chamoun, Ahmed Serhouchni*
3. On the Impact of Device Characteristics on Opportunistic Network Performance  
   *Raphael Bialon, Jan Steimann, Kalman Graffi*
4. Divide to Conquer: Functional Decomposition to Support Model-Based Engineering of Command and Control of Cyber-Physical Systems  
   *Alexandre Canny, Camille Fayollas, Célia Martinie, David Navarre, Philippe Palanque, Christine Gris, Yannick Deleris*
CPSCCom-Postero Session 3
Session Chair: Jun Yi, Georgia State University

1. Energy-efficient Privacy Preserving Data Aggregation Protocols based on Slicing
   Xiaowei Zhang, Xiaowu Liu, Jiguo Yu, Nan Yang, Xiaohan Qi, Qiang Zhang
2. Sparse Bayesian Flood Forecasting Model Based on SMOTEBoost
   Yirui Wu, Yuekai Ding, Feng Jun
3. Research on master-slave distributed large-scale poultry farming measurement and control system
   Qun Yu, Yan Zhang, Xiuli Wang, Zhunan Zhou, Pingping Xian, Fenghang Zhang
4. Efficient Placement of Meteorological Big Data Using NSGA-III in Cloud Environment
   Tao Huang, Feng Ruan, Shengjun Xue, Ranran Dai, Qiu Yang
5. Research on Abnormal Detection Technology of Real-time Interaction Process in New Energy Network
   Bo Peng, Xin Li, Xiuli Huang, Xiaoxuan Fei, Wei Cheng, Junhui Cai
   Ji Lai, Shijian Zhang, Tian Qiu
7. Spatio-Temporal Attention LSTM Model for Flood Forecasting
   Yirui Wu, Yuekai Ding, Feng Jun, Yuelong Zhu, Zirun Cheng
8. An Extensible Toolkit for Resource Usage Prediction in Clouds
   Yuan Wang, Yeping Wen, Yu Zhang, Jinhui Chen
   Zhiquo Qu, Xinzhu Liu, Shengyao Wu
10. NMF-Based Privacy-Preserving Collaborative Filtering on Cloud Computing
    Tao Li, Yongzhen Ren, Yongjun Ren, Lina Wang, Lingyun Wang, Lei Wang
11. A Nephogram Recognition Algorithm Based on Cloud Computing Platform
    Tao Li, Lei Wang, Yongjun Ren, Xiang Li
12. Precise Subsidization Grants for College Students Over Big Data Optimized Random Forest
    Ranran Dai, Shi Cheng, Tao Huang, Xianyi Cheng, Fengmei Chen
13. An Analysis and Assessment of Kriging Interpolation Algorithm for Merging Meteorological High-resolution Precipitation
    Ming Yang, Xiaolong Xu, Qing Chen, Ying Liu, Zhuyu Gao, Yufeng Chen, You Zeng
    Yuxue Yang, Guohua Ji, Zhengyi Yang, Shengjun Xue
15. Optimal Model Design for the Cyber-insurance Contract with Asymmetric Information
    Yuxue Yang, Qin Yang, Zhengyi Yang, Shengjun Xue
16. A Novel FCA-Based Method for Mining The Attribute Dependence of Different Granularities from Real Estate Data
    Jingying Tian
17. Combined Navigation Method of RBF Neural Network Based on Quantum Genetic Algorithm in Edge Devices
    Fei Xiong, Yong Cao, Fei Dai, Yu Cheng Li
18. Node Localization in Wireless Sensor Networks Based on Quantum Annealing Algorithm and Edge Computing
    Yong Cao, Youjie Zhao, Fei Dai
19. Tropical Cyclone Maximum Wind Estimation from infrared satellite data with Integrated Convolutional Neural Networks
    Tian Wei, Wei Huang, Xiaolong Xu, Chao Wang
20. Bidirectional Removal of Reverse Gravitational Acceleration Based on Data Segmentation
    Xing Li, Zhenjie Hou, Jiuzhen Liang, Xingzi Chan
| 1.  | An Improved Otsu Method based on Uniformity Measurement for Segmentation of Water Surface Images  
Ning Li, Xin Lv, Bo Li, Shoukun Xu |
| 2.  | A Multi-Modal Gaze Tracking Algorithm  
Haiming Su, Zhenjie Hou, Juan Huan, Ke Yan, Hao Ding |
| 3.  | An Advanced Deep Learning Approach for Safety Helmet Wearing Detection  
Yuwan Gu, Shoukun Xu, Yaru Wang, Lin Shi |
| 4.  | Towards Efficient Medical Video Super-Resolution based on Deep Back-Projection Networks  
Sheng Ren, HaiFu Guo, Yan He |
| 5.  | Multi-miner's Cooperative Evolution Method of Bitcoin Pool Based on Temporal Difference Learning Method  
Wei Ou, Mingwei Deng, Entao Luo, Wei Shi, Zhiyuan Tan, Md Zakirul Alam Bhuiyan |
| 6.  | Prediction of Learners' Academic Performance using Factorization Machine and Decision Tree  
Junjie Hou, Yiping Wen |
| 7.  | HTIME: A Hash-Based Terminal Identification Method in Cloud Environment  
Bowen Liu, Xutong Jiang, Song Zhang, JiaBang Liu, Wanchun Dou |
| 8.  | A High-Efficiency Spike Sorting Cloud-Edge Computing system with DL-DFCM  
Shengyi Qian, Hui Hong, Zhengfei Zhu, Keming Chen, Nenggan Zheng and Yan Qi |
| 9.  | Ant Colony Based Energy Consumption Optimization for Mobile IoT Networks  
Hong-Yan Zhao, Jia-Chen Wang, Xin Guan, Zhihong Wang, Yong-Hui He, Hong-Lin Xie |
Wei Tian, Renhao Gu, Ruan Feng, Xihua Liu, Shucun Fu |
| 11. | A Novel Color Image Watermarking Algorithm Based on Digital Signature  
Xinchun Cui, Yilei Wang, Xiangwei Zheng, Yingshuai Han, Hong Qiao, and Shancang Li |
| 12. | Optimization Methods of Real-Time Operating System for Artificial Organs  
Pan Lv, YiQi Li, Hong Li, Guoqing Yang, Kailai Shao |
| 13. | Review of Intelligent Control Methods for Greenhouse Cluster Systems  
Wenwen Gong, Xiangnan Zhang, Yawei Wang, Wenda Tang, Yifei Chen, Dan Li |
| 14. | Camshift Tracking Method Based on Correlation Probability Graph for Model Pig  
Xiangnan Zhang, Wenwen Gong, Qifeng He, Haolong Xiang, Dan Li, Yawei Wang, Yifei Chen, Yaqian Deng, Fanglin Geng, Yongtao Liu |
| 15. | Research on Improved Pedestrian Detection Algorithm Based on Convolutional Neural Network  
Jiachi Wang, Hang Li, Shoulin Yin, Yang Sun |
| 16. | Effects of Aerobic Exercise and Resistance Exercise on Chronic Inflammation in Obese Adolescents  
Hui Yang, Hongxin Chen |
| 17. | Medical Endoscope Intelligent Service System Oriented for Data Separation Computing Architecture  
Jun Zheng, Jun Li, Ligang Lou, Siyao Chen, Jingyi Feng |
| 18. | Optimization Algorithms in Reconstructions of Neuron Morphology: An Overview  
Chao Liu, Nenggan Zheng, Ting Zhao |
| 19. | A simulation method of three-dimensional cloud based on WRF data  
Yonghua Xie, Xiaoyong Kou, Ping Li, Shucun Fu |
The CPSCom 2019 Technical Program

**Wednesday July 17, 2019**

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<th>Time</th>
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The SmartData 2019 Technical Program

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# The SmartData 2019 Technical Program

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<tr>
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<tr>
<td>17:10-18:30</td>
<td>IEEE Cybermatics Summit on Cyber Science and Engineering</td>
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</table>

## SmartData-S1: Big Data Analytics and Its Services (I)
**Session Chair: Carson Leung, University of Manitoba**

1. Extracting Sensing Data from PLCs in Smart Manufacturing Machines  
   *Bunrong Leang; Sokchomrern Ean; Rock-Won Kim; Su-Young Chi; Kwan-Hee Yoo*

2. An Adaptive Selection Scheme for OpenGL SC Shader Binary Programs  
   *Nakhoon Baek*

   *Pheng Tola; Rockown Kim; Kwan-Hee Yoo; Ga Ae Ryu*

## SmartData-S2: Big Data Analytics and Its Services (II)
**Session Chair: Kwan-Hee Yoo, Chungbuk National University**

1. Flexible POI Recommendation based on User Situation  
   *Sein Jang; Jeong-Hun Kim; Young-Ho Park; Aziz Nasridinov*

2. Big Data Analytics and Services for Smart Data  
   *Carson Leung; Bryan Wodi*
The SmartData 2019 Technical Program

Tuesday July 16, 2019

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<td>Banquet</td>
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**SmartData-M1: Smart Data Processing and Analytics**

**Session Chair: Rajshekhar Sunderraman, Georgia State University**

1. Gated Recurrent Neural Networks Empirical Utilization for Time Series Classification
   - Nelly Elsayed; Anthony Maida; Magdy Bayoumi
2. Content-Based Image Retrieval Based on Improved Rotation Invariant LBP Descriptor
   - Shuai Wang; Yingying Zhang
3. PDF-DS: Privacy-Preserving Data Filtering for Distributed Data Streams in Cloud
   - Yifan Tian; Jiawei Yuan; Yantian Hou

**SmartData-M2: Smart Data Applications**

**Session Chair: Aziz Nasridinov, Chungbuk National University**

   - Xueli Xiao; Thosini Bamunu Mudiyanselage; Chunyan Ji; Jie Hu; Yi Pan
2. Deep Learning for Asphyxiated Infant Cry Classification Based on Acoustic Features and Weighted Prosodic Features
   - Chunyan Ji; Xueli Xiao; Sunitha Basodi; Yi Pan
   - Anil Acharya; Yantian Hou; Ying Mao; Jiawei Yuan
The SmartData 2019 Technical Program

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# The Blockchain 2019 Technical Program

## Sunday July 14, 2019

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<td>09:00-09:10</td>
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<tr>
<td>09:10-10:25</td>
<td>AiChain Workshop Session #1 (Atlanta 1)</td>
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<td>10:25-10:35</td>
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<td>10:35-11:50</td>
<td>AiChain Workshop Session #2 (Atlanta 1)</td>
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<td>11:50-12:00</td>
<td>Workshop Summary and Wrap-up</td>
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## AiChain Workshop

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<td>09:10-10:15</td>
<td>Workshop Keynote: Aziz Mohaisen</td>
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<td>LightChain Workshop Session #1 (Atlanta 2)</td>
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<td>12:30-13:30</td>
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<td>13:30-15:30</td>
<td>LightChain Workshop Session #2 (Atlanta 2)</td>
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## LightChain Workshop

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<tr>
<td>09:00-09:05</td>
<td>Welcome</td>
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<tr>
<td>09:05-10:15</td>
<td>Throughput, Latency and Scalability</td>
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<td>10:30-12:30</td>
<td>Air Gapped Wallet Schemes and Private Key Leakage in Permissioned Blockchain Platforms</td>
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## AiChain Session #1

**Session Chair: Oshani Seneviratne, Rensselaer Polytechnic Institute**

1. Decentralized & Collaborative AI on Blockchain Platforms  
   *Justin D Harris; Bo Waggoner*

2. A Reputation Management Framework for Knowledge-Based and Probabilistic Blockchains  
   *Tara Salman; Raj Jain; Lav Gupta*

3. Account Recovery in Decentralized Applications  
   *Yanlin Zhu; Lirong Xia; Oshani Seneviratne*

## AiChain Session #2

**Session Chair: Oshani Seneviratne, Rensselaer Polytechnic Institute**

1. Private Group Communication in Blockchain Based on Diffie-Hellman Key Exchange  
   *Zachary Laney, Yoohwan Kim*

2. Decentralized Energy Forecasting Markets using Distributed Ledger Technology  
   *Umit Cali, Vinayak Sharma*

3. Blockchain-based Real Estate market: One method for Applying Blockchain Technology in Commercial Real Estate Market  
   *Sobhan Latifi, Yunpeng Zhang, and Liang-Chieh Cheng*

## LightChain Session #1

**Session Chair: Sachin Shetty, Old Dominion University**

1. Performance Analysis of a Hyperledger Fabric Blockchain Framework: Throughput, Latency and Scalability  
   *Murat Kuzlu; M. Pipattanasomporn; Levent Gurses; Saifur Rahman*

2. Air Gapped Wallet Schemes and Private Key Leakage in Permissioned Blockchain Platforms  
   *Amanda Davenport; Sachin Shetty*

3. Blockchain Implementation for Analysis of Carbon Footprint across Food Supply Chain  
   *Denisolt Shakhbuloatov, Arshit Arora, Ziqian Dong; Roberto Rojas-Cessa*

4. Lightweight Blockchain-based Privacy Protection for Smart Surveillance at the Edge  
   *Alem Fitwi and Yu Chen; Sencun Zhu*
1. Formal Verification of Smart Contracts using Interface Automata  
   Gabor Madl, Luis Bathen and German Flores; Divyesh Jadav
2. BlendMAS: A Blockchain-ENabled Decentralized Microservices Architecture for Smart Public Safety  
   Ronghua Xu, Seyed Nikouei, Yu Chen; Erik Blasch; Alexander Aved
3. Scalable Distributed Random Number Generation based on Homomorphic Encryption  
   Khuong Nguyen-An, Thanh Nguyen-Van; Anh-Tuan Nguyen, Tien-Dat Le; Minh-Phuoc Nguyen-Ho, Tuong Nguyen-Van; Nhat-Quang Le
4. Smart Contract-based Secured Business-to-Consumer Supply Chain Systems  
   Feiyang Qu, Hisham Haddad, Hossain Shahriar
The Blockchain 2019 Technical Program

Monday July 15, 2019

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<tr>
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<td>Blockchain-M5 (Atlanta 1)</td>
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Note: M(Main conference), S(Symposium)

**Blockchain-M1: Attacks on Blockchain**

**Session Chair: Ivan Homoliak, Singapore University of Technology and Design**

1. TendrilStaller: Block Delay Attack in Bitcoin  
   *Matthew Walck; Ke Wang; Hyong Kim*
2. Cascading Machine Learning to Attack Bitcoin Anonymity  
   *Francesco Zola; Maria Eguimendia; Jan Bruse; Raul Orduna Urrutia*
3. Effective scheme against 51% Attack on Proof-of-Work Blockchain with History Weighted Information  
   *Xinle Yang; Yang Chen; Xiaohu Chen*
4. Data Mining-based Ethereum Fraud Detection  
   *Ej Jung; Marion Le Tilly; Ashish Gehani; Yunjie Ge*

**Blockchain-M2: Blockchain Performance Analysis**

**Session Chair: Vojislav Misic, Ryerson University Toronto**

1. A Theoretical Model for Fork Analysis in the Bitcoin Network  
   *Yahya Shahsavari; Kaiwen Zhang; Chamseddine Talhi*
2. IBFT Liveness Analysis  
   *Roberto Saltini*
3. Fork Rate-based Analysis of the Longest Chain Growth Time Interval of a PoW Blockchain  
   *Hirotsugu Seike; Yasukazu Aoki; Noboru Koshizuka*
4. On forks and fork characteristics in a Bitcoin-like distribution network  
   *Vojislav B. Mišić; Jelena Mišić; Xiaolin Chang*

**Blockchain-M3: Hybrid Blockchain Architecture**

**Session Chair: Vojislav Misic, Ryerson University Toronto**

1. Hybrid Blockchain Design for Privacy Preserving Crowdsourcing Platform  
   *Saide Zhu; Huafu Hu; Yingshu Li; Wei Li*
2. A Hybrid Blockchain Architecture for Privacy-Enabled and Accountable Auctions  
   *Harsh Desai; Murat Kantarcıoglu; Lalana Kagal*
3. Access Control for Electronic-Health Records with Hybrid Blockchain-Edge Architecture  
   *Hao Guo; Wanxin Li; Mark Nejad; Chien-Chung Shen*
4. BlockIPFS - Blockchain-enabled Interplanetary File System for Forensic and Trusted Data Traceability  
   *Emmanuel Nyaletey; Reza M. Parizi; Qi Zhang; Kim-Kwang Raymond Choo*
Blockchain-M4: Blockchain Protocol
Session Chair: EJ Jung, University of San Francisco
1. Proteus: A Scalable BFT Consensus Protocol for Blockchains
   Mohammad Jalalzai; Costas Busch; Golden G. Richard
2. Aurora: a Robust and Trustless Verification and Synchronization Algorithm for Distributed Ledgers
   Federico Matteo Bencic; Ivana Podnar Zarko; Alen Hrga
3. Contract-based Approach for Security Deposit in Blockchain Networks with Shards
   Jing Li; Tingting Liu; Dusit Niyato; Ping Wang; Jun Li; Zhu Han
4. Deviant: A Mutation Testing Tool for Solidity Smart Contracts
   Patrick Chapman; Dianxiang Xu; Lin Deng; Yin Xiong

Blockchain-M5: Game Theory and Algorithms in Blockchain
Session Chair: Wei Li (Georgia State University)
1. Bitcoin Mining with Transaction Fees: A Game on the Block Size
   Jie Wu; Suhan Jiang
2. An Efficient Miner Strategy for Selecting Cryptocurrency Transactions
   Saulo dos Santos; Ruppa K. Thulasiram; Shahin Kamali; Chukwuocha Chibundo
3. Strategy of Blockchain Dividing Based on Node Community Clustering in Intelligent Manufacturing CPS
   Suisheng Li; Hong Xiao; Jingwei Qiao; Tao Wang; Shaofung Liu; Hao Wang
4. Proximity Neighbor Selection in Blockchain Networks
   Yusuke Aoki; Kazuyuki Shudo
5. Bitcoin Option Pricing Using LSTM-based Prediction Model and Blockchain Statistics
   Lun Li; Ali Arab; Jiqiang Liu; Jingxian Liu; Zhu Han

Blockchain-M6: Blockchain and IoT
Session Chair: Ruppa Thulasiram (University of Manitoba, Canada)
1. Towards Secure and Decentralized Sharing of IoT Data
   Hien Thi Thu Truong; Miguel Almeida; Ghassan O. Karame; Claudio Soriente
2. ChainSplitter: Towards Blockchain-based Industrial IoT Architecture for Supporting Hierarchical Storage
   Gang Wang; Zhijie Shi; Mark Nixon; Song Han
3. A Decentralized, Trust-less Marketplace for Brokered IoT Data Trading using Blockchain
   Shaimaa Bajouhdah; Changyu Dong; Paolo Missier
   Zachary James Zaccagni; Aditya Paul; Ram Dantu
5. SSP: Self-Sovereign Privacy for Internet of Things using Blockchain and MPC
   Tiffany Hyun-Jin Kim; Joshua D. Lampkins
The Blockchain 2019 Technical Program

**Tuesday July 16, 2019**

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**Blockchain-M7: Blockchain Measurement**

**Session Chair: Stefan Schmid, University of Vienna**

1. A Measurement Study of Bitcoin Lightning Network
   Yuwei Guo; Jinfeng Tong; Chen Feng
2. Evaluating The Impact of Network Latency on The Safety of Blockchain Transactions
   Luming Wan; David M Eyers; Haibo Zhang
3. Remote Configuration of Integrated Circuit Features and Firmware Management via Smart Contract
   Md Nazmul Islam; Sandip Kundu
4. Lockless Transaction Isolation in Hyperledger Fabric
   Hagar Meir; Artem Barger; Yacov Manevich; Yoav Tock

**Blockchain-M8: Applied Cryptography in Blockchain**

**Session Chair: Meng Han, Kennesaw State University**

1. zk-AuthFeed: How to Feed Authenticated Data into Smart Contract with Zero Knowledge
   Zhiguo Wan; Zhangshuang Guan; Zhou Yan; Kui Ren
2. Initial Public Offering (IPO) on Permissioned Blockchain using Secure Multiparty Computation
   Fabrice Benhamouda; Angelo De Caro; Shai Halevi; Tzipora Halevi; Charanjit Jutla; Yacov Manevich; Qi Zhang
3. A Fully Decentralized Time-Lock Encryption System on Blockchain
   Wei-Jr Lai; Chih-Wen Hsueh; Ja-Ling Wu
4. Breeding Unicorns: Developing Trustworthy and Scalable Randomness Beacons
   Stefan Schmid; Yvonne-Anne Pignolet; René Rydhof Hansen; Michael Jensen; Sebastian Ro Kristensen; Mathias Sass Michno; Samvid Dharanikota

**Blockchain-M9: Blockchain Application (I)**

**Session Chair: Vojislav Misic, Ryerson University Toronto**

1. A Proposal For Account Recovery in Decentralized Applications
   Yanlin Zhu; Lirong Xia; Oshani Seneviratne
2. DaiMoN: A Decentralized Artificial Intelligence Model Network
   Surat Teerapittayanon; Ht Kung
3. E2C-Chain: A Two-stage Incentive Education and Employment Certification Blockchain
   Liyuan Liu; Meng Han; Yiyun Zhou; Reza M. Parizi
4. Ownership preserving AI Market Places using Blockchain
   Nishant Baranwal Somy; Kalapriya Kannan; Vijay Arya; Sandeep Hans; Abhishek Singh; Pronay Lohia; Sameep Mehta
Blockchain-M10: Blockchain Application (II)  
Session Chair: Meng Han, Kennesaw State University  
1. Enhancing Blockchain Traceability with DAG-based Tokens  
   Hiroki Watanabe; Tatsuro Ishida; Shigenori Ohashi; Shigeru Fujimura; Atsushi Nakadaira; Kota Hidaka; Junichi Kishigami  
2. CoDAG: An Efficient and Compacted DAG-based Blockchain Protocol  
   Shu Yang; Ziteng Chen; Laizhong Cui; Mingwei Xu; Zhongxing Ming; Ke Xu  
3. Properties of the Tangle for Uniform Random and Random Walk Tip Selection  
   Bartosz Kusmierz; William Sanders; Andreas Penzkofer; Angelo Capossele; Alon Gal  
4. Scalable Privacy-Preserving Query Processing Over Ethereum Blockchain  
   Shlomi Linoy; Hassan Mahdikhani; Suprio Ray; Rongxing Lu; Natalia Stakhanova; Ali A. Ghorbani

Blockchain-M11: Permissioned Blockchain  
Session Chair: Mark Nejad, University of Delaware  
1. SharPer: Sharding Permissioned Blockchains Over Network Clusters  
   Mohammad Javad Amiri; Divyakant Agrawal; Amr El Abbadi  
2. Traceability in Permissioned Blockchain  
   Tatsuo Mitani; Akira Otsuka  
3. A Heuristic-based Private Bitcoin Payment Network Formation Using Off-Chain Links  
   Enes Erdin; Mumin Cebe; Kemal Akkaya; Eyuphan Bulut; Selcuk Uluagac  
4. TrustChain: Trust Management in Blockchains and IoT supported Supply Chains  
   Sidra Malik; Salil S Kanhere; Raja Jurdak; Volkan Dedegolu

Blockchain-S1: Blockchain Enhancement (I)  
Session Chair: Jay Kishigami, Muroran-IT  
1. BeaconBlocks: Augmenting Proof-of-Stake with On-Chain Time Synchronization  
   Alexander Hartl; Tanja Zseby; Joachim Fabini  
2. Token-based Sharing Control for IPFS  
   Shigenori Ohashi; Hiroki Watanabe; Tatsuro Ishida; Shigeru Fujimura; Atsushi Nakadaira; Junichi Kishigami  
3. Privacy-preserving and Efficient Multi-keyword Search Over Encrypted Data on Blockchain  
   Shan Jiang; Jiannong Cao; Julie McCann; Yanni Yang; Yang Liu; Xiaoqing Wang; Yuming Deng

Blockchain-S2: Blockchain Enhancement (II)  
Session Chair: Mark Nejad, University of Delaware  
1. Decentralized & Collaborative AI on Blockchain  
   Justin D Harris; Bo Waggoner  
2. FastChain: Scaling blockchain system with informed neighbor selection  
   Ke Wang; Hyong Kim  
   Gbadebo Ayoade; Erick Bauman; Latifur Khan; Kevin Hamlen
The Blockchain 2019 Technical Program

Wednesday July 17, 2019

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Blockchain-S3: Blockchain Marketplace
Session Chair: Cliff Zou, University of Central Florida
1. Deterministic Sub-Wallet for Cryptocurrencies
   Hossein Rezaeighaleh; Cliff Zou
   Chongyang Bai; Tommy White; Linda Xiao; VS Subrahmanian; Ziheng Zhou
3. Toward a Blockchain-Based Industrial Marketplace for Self-Maintaining Machines
   Daniel Miehle; Matthias Meyer; Andre Luckow; Bernd Bruegge
4. Blockchain Simulator
   Carlos Miehle; Miguel Correia

Blockchain-S4: Blockchain Platform (I)
Session Chair: Wei Li, Georgia State University
1. ArtChain: Blockchain-enabled Platform for Art Marketplace
   Ziyuan Wang
2. A Decentralized Service-Platform Towards Cross-Domain Entitlement Handling
   Alexander Rech; Markus Pistauer; Christian Steger
3. BlockV: A Blockchain Enabled Peer-Peer Ride Sharing Service
   Panchalika Pal; Sushmita Raj
4. A Permissioned Blockchain based Access Control System for IOT
   MD Azharul Islam; Sanjay Madria

Blockchain-S5: Blockchain Platform (II)
Session Chair: Yan Huang, Kennesaw State University
1. Ensuring Genuineness for Selectively Disclosed Confidential Data using Distributed Ledgers: Applications to Rail
   Wayside Monitoring
   Matthias Lohr; Jonathan Hund; Steffen Staab; Jan Jürjens
2. Yugala: Blockchain based Encrypted Cloud Storage for IoT Data
   Sarada Prasad Gochhayat; Eranga Herath; Sachin Shetty; Peter Foytik
3. EduCoin: Secure and Efficient Payment for MOOC Environment
   Lingling Lu; Jianhai Chen; Zijian Tian; Qinming He; Butian Huang; Yang Xiang; Zhenguang Liu
4. From Oracles to Trustworthy Data On-chaining Systems
   Jonathan Heiss; Jacob Eberhardt; Stefan Tai

Blockchain-S6: Blockchain Platform (III)
Session Chair: Yan Huang (Kennesaw State University)
1. Blockchain-based Charging Coordination Mechanism for Smart Grid Energy Storage Units
   Mohamed Baza;
   Mahmoud Nabil; Mohammad Ismail; Mohamed M E A Mahmoud; Erchin Serpedin; Mohammad Ashiqur Rahman
2. A Security Reference Architecture for Blockchains
   Ivan Homoliak; Sarad Venugopalan; Qingze Han; Pawel Szalachowski
   Amjad Alduweesh; Maher Alharby; Maryam Mehrnezhad; Aad Van Moorsel
4. Endorsement in Hyperledger Fabric
   Alessandro Sorniotti; Angelo De Caro; Angelo Androulakis; Matthias Neugschwandtner
The SpaCCS 2019 Technical Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>08:00-14:00</td>
<td>Registration</td>
</tr>
<tr>
<td>18:00-20:30</td>
<td>Reception</td>
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</table>
# The SpaCCS 2019 Technical Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>08:00-16:00</td>
<td>Registration</td>
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<tr>
<td>09:00-09:40</td>
<td>Opening</td>
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<tr>
<td>09:40-10:40</td>
<td>Keynote 1: S. S. Iyengar (Chaired by Stephen Yau)</td>
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<tr>
<td>10:40-11:10</td>
<td>Coffee Break</td>
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<tr>
<td>11:10-12:30</td>
<td>SpaCCS-M1 (Atlanta 5) SpaCCS-M2 (Georgia 3)</td>
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<tr>
<td>12:30-13:30</td>
<td>Lunch</td>
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<tr>
<td>13:30-14:50</td>
<td>SpaCCS-M4 (Atlanta 5) SpaCCS-M3 (Georgia 3)</td>
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<td>14:50-15:20</td>
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<tr>
<td>15:20-17:00</td>
<td>SpaCCS-M5 (Atlanta 5) SpaCCS-M6 (Georgia 3)</td>
</tr>
<tr>
<td>17:10-18:30</td>
<td>IEEE Cybermatics Summit on Cyber Science and Engineering</td>
</tr>
</tbody>
</table>

**Note:** M(Main conference), S(Workshop/Symposium)

### SpaCCS-M1: Security in Communication (I)
**Session Chair: Maode Ma, Nanyang Technological University**

1. Blockchain-based Mobility Management for LTE and Beyond  
   *Han Lee, and Maode Ma*
2. Visualization of DNS Tunneling Attacks using Parallel Coordinates Technique  
   *Yasir F. Mohammed, and Dale R. Thompson*
3. A Data-Driven Network Intrusion Detection Model based on Host Clustering and Integrated Learning: A Case Study on Botnet Detection  
   *Lena Ara, and Xiao Luo*
4. TLShps: SDN-based TLS Handshake Protocol Simplification for IoT  
   *Lei Yan, Yan Ma, and Maode Ma*

### SpaCCS-M2: Privacy (I)
**Session Chair: Dwight Makaroff, University of Saskatchewan**

1. Distributed Privacy Preserving Platform for Ridesharing Services  
   *Yevhenii Semenko, and Damien Saucez*
2. EPT: EDNS Privacy Tunnel for DNS  
   *Lanlan Pan, Jie Chen, Anlei Hu, and Xuebiao Yuchi*
3. End-to-end Encryption Schemes for Online Social Networks  
   *Fabian Schillinger, and Christian Schindelhauer*

### SpaCCS-M3: Privacy (II)
**Session Chair: Dwight Makaroff, University of Saskatchewan**

1. A Verifiable Encryption Scheme Supporting Fuzzy Search  
   *Ruwei Huang, Zhikun Li, and Sigi Chen*
2. A Verifiable Fully Homomorphic Encryption Scheme  
   *Ruwei Huang, Zhikun Li, and Sigi Chen*
3. A Study on Anonymous Protocol in a Permission Blockchain with Ensure Privacy for a Member  
   *Gyeong-Jin Ra, Daehee See, Md Zakirul Alam Bhuian, and Im-Yeong Lee*
4. Information Leakage in Wearable Applications  
   *Babatunde Olabenjo, and Dwight Makaroff*
SpaCCS-M4: Security in Computation (I)
Session Chair: Yunpeng Zhang, University of Houston
1. A Lightweight Secure Communication Protocol for IoT devices using Physically Unclonable Function
   Priyanka Mall, Md Zakirul Alam Bhuiyan, and Ruhul Amin
2. Ensuring Data Integrity in Fog Computing Based Healthcare Systems
   Abdulwahab Alazeb, and Brajendra Panda
3. Modelling Security Requirements for Software Development with Common Criteria
   Amara Naseer, Zhiqi Huang, and Ali Awais

SpaCCS-M5: Security in Communication (II)
Session Chair: Yunpeng Zhang, University of Houston
1. Using Machine Learning to Find Anomalies in Fieldbus Network Traffic
   Peters Martin, Gothz Johannes, Wiedenmann Simeon, and Mundt Thomas
2. A New Intrusion Detection System Based on Gated Recurrent Unit(GRU) and Genetic Algorithm
   Mahdi Manavi, and Yunpeng Zhang
3. Topic Model Based Android Malware Detection
   Yucai Song, Yang Chen, Bo Lang, Hongyu Liu, and Shaojie Chen
4. Secure Communication in UAV Assisted HetNets: A Proposed Model
   Aabid Rashid, Diwankshi Sharma, Sumeet Gupta, and Sachin Kumar Gupta

SpaCCS-M6: Security in Storage
Session Chair: Damien Saucez, Inria
1. Ransomware Attack Protection: A Cryptographic Approach
   Anjali Kumari, Zakirul Alam Bhuiyan, Jigyasa Namdeo, Shipra Kanaujia, Ruhul Amin, and Satyanarayana Vollala
2. Paper Document Authentication Using Print-scan Resistant Image Hashing and Public-key Cryptography
   Fawad Ahmad, and Lee-Ming Cheng
3. Method of Deep Web Collection for Mobile Application Store Based on Category Keyword Searching
   Guosheng Xu, Zhimin Wu, Lu Wang, Zhiyong Wang, Chengze Li, Jinghua Yan, Jing Yuan, and Hao Wu
4. Cyber Weapons Storage Mechanisms
   Muhammd Mudassar Yamin, Basel Katt, and Mazaher Kianpour
The SpaCCS 2019 Technical Program

**Tuesday July 16, 2019**

<table>
<thead>
<tr>
<th>08:00-16:00</th>
<th>Registration (Room: in front of Room Georgia 1)</th>
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<tbody>
<tr>
<td>09:00-10:00</td>
<td>Keynote 2: Schahram Dustdar (Chaired by Laurance Yang)</td>
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<tr>
<td>10:00-11:00</td>
<td>Keynote 3: Richard Brooks (Chaired by Raj Sunderraman)</td>
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<td>Coffee Break</td>
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<td>11:20-12:40</td>
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<td>13:40-15:00</td>
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<td>15:20-16:20</td>
<td>SpaCCS-M9 (Atlanta 5) SpaCCS-W2 (Georgia 3)</td>
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<td>16:20-17:40</td>
<td>SpaCCS-M10 (Atlanta 5) SpaCCS-W3 (Georgia 3)</td>
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<tr>
<td>17:00-18:30</td>
<td>IEEE Cybermatics Summit on Blockchain: Advances, Challenges &amp; Applications</td>
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<tr>
<td>19:00-21:30</td>
<td>Banquet</td>
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**SpaCCS-M7: Anonymity**  
**Session Chair:** David Maimond, Georgia State University  
   *Tze Chiang Tin, Saw Chin Tan, and Ching Kwang Lee*  
2. Characteristics of Bitcoin Transactions on Cryptomarkets  
   *Xucan Chen, Mohammad Al Hasan, Xintao Wu, Pavel Skums, Mohammad Javad Feizollahi, Marie Ouellet, Eric L. Sevigny, David Maimon, and Yubao Wu*  
3. A Closer Look At Anonymous Proxy Re-encryption Schemes  
   *Sharmila Deva Selvi, C. Pandu Rangan, Harish S., and Swethashree Dhanabal*

**SpaCCS-M8: Security in Communication (III)**  
**Session Chair:** Yubao Wu, Georgia State University  
1. Data Protection Labware for Secure Mobile Software Development  
   *Hossain Shahriar, Kai Qian, Md Arabin Talukder, Mike Whitman, Hongmei Chi, Mohammad Rahman, and Sheikh Ahamed*  
2. Python Scrapers for Scraping Cryptomarkets on Tor  
   *Yubao Wu, Fengpan Zhao, Xucan Chen, Pavel Skums, Eric L. Sevigny, David Maimon, Marie Ouellet, Monica Haavisto Swahn, Seryl M Strasser, Mohammad Javad Feizollahi, Youfang Zhang, and Gunjan Sekhon*  
3. Effectiveness of Machine Learning based Intrusion Detection Systems  
   *Mohammed Alrowaily, Freeh Alenezi, and Zhuo Lu*  
4. DNS Flood Attack Mitigation Utilizing Hot-lists and Stale Content Updates  
   *Tasnuva Mahjabin, and Yang Xiao*

**SpaCCS-M9: Security in Communication (IV)**  
**Session Chair:** Yubao Wu, Georgia State University  
1. Detection of Application-Layer Tunnels with Rules and Machine Learning  
   *Huaying Lin, Gao Liu, and Zheng Yan*  
2. Automated Construction of Malware Families  
   *Krishnendu Ghosh, and Jeffery Mills*  
3. Approximate String Matching for DNS Anomaly Detection  
   *Roni Mateless, and Michael Segal*
SpaCCS-M10: Security in Computation (II)
Session Chair: Yubao Wu, Georgia State University
   C Q Cheng, Tan Saw Chin, Ching Kwang Lee, Z. Yusoff, and R. Kaspin
2. Challenges and Future Direction of Time-Sensitive Software-Defined Networking (TSSDN) in Automation industry
   Ng Kean Haur, and Tan Saw Chin
3. An Encryption based Approach to Protect Fog Federations from Rogue Nodes
   Mohammed Alshehri, and Brajendra Panda
   Melodee Montgomery, Prosenjit Chatterjee, and Kaushik Roy

SpaCCS-W1: Security and Privacy on Internet of Things
Session Chair: Shachar Siboni, Ben-Gurion University of the Negev
1. A Weighted Risk Score Model for IoT Devices
   Shachar Siboni, Chanan Glezer, Asaf Shabtai, and Yuval Elovici
2. Privacy-Preserving Big Data Analytics: From Theory to Practice
   Mohammad G. Raceini, and Mehrdad Nojoumian
3. Software Quality Optimization: Tools & Techniques
   Allah Bachayo Brohi, Pinial Khan Butt, Shaobo Zhang, and Faisal U Rehman Qureshi
4. PINGCHEGO: An Android Real-time Carpooling System
   Xuesong Wang, Yizhi Liu, Zhengtao Jiang, You Peng, and Tianhao Yin

SpaCCS-W2: Sensor-Cloud Systems (I)
Session Chair: Shachar Siboni, Ben-Gurion University of the Negev
1. Limited Memory Eigenvector Recursive Principal Component Analysis in Sensor-Cloud Based Adaptive Operational Modal Online Identification
   Cheng Wang, Haiyang Huang, Tianshu Zhang, and Jianwei Chen
2. Optimization of Optical Imaging MIMO-OFDM Precoding Matrix for Underwater VLC
   Yanlong Li, Hongbing Qiu, Xiao Chen, Jielin Fu, Junyi Wang, and Yitao Zhang
3. Data Collection Scheme for Underwater Sensor Cloud System Based on Fog Computing
   Haitao Yu, Jiansheng Yao, and Xianhao Shen
4. A Survey on Fog Computing
   Rui Huang, Yu Sun, Chao Huang, Guang Zhao, and Ying Ma

SpaCCS-W3: Sensor-Cloud Systems (II)
Session Chair: David Maimond, Georgia State University
1. An Approximate Data Collection Algorithm in Space-based Internet of Things
   Changjiang Fei, Baokang Zhao, Wanrong Yu, and Chunqing Wu
2. Outlier Detection of Internet of Vehicles
   Yingming Zeng, Huanlei Zhao, Haibin Zhang, and Qian Zhang
   Ying Ma, Chao Huang, Yu Sun, Guang Zhao, and Yunjie Lei
4. Naïve Approach for Bounding Box Annotation and Object Detection towards Smart Retail Systems
   Pubudu Ekanayake, Chenhui Yang, Li Deng, and Xin Hong
5. Evaluation of Face Recognition Techniques Based on Symlet 2 Wavelet and Support Vector Machine
   Zhipeng Li, Xuesong Jiang, and Yewen Pang
6. CP-MCNN: Multi-label Chest X-ray Diagnostic based on Confidence Predictor and CNN
   Huazhen Wang, Junlong Liu, Sisi Lai, Nengguang Wu, and Jixiang D
**The SpaCCS 2019 Technical Program**

**Wednesday July 17, 2019**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>08:00-14:00</td>
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<td>09:00-10:00</td>
<td>Keynote 4: Mohammed Atiquzzaman (Chaired by Zheng Yan)</td>
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<tr>
<td>10:00-11:00</td>
<td>Keynote 5: James Irvine (Chaired by Anu Bourgeois)</td>
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<tr>
<td>11:20-12:40</td>
<td>SpaCCS-W6 (Georgia 3)</td>
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</tbody>
</table>

**SpaCCS-W4: Trust, Security and Privacy for Emerging Applications**

*Session Chair: Mark Quinlan, University of Oxford*

1. Connected Vehicles: A Privacy Analysis
   - Mark Quinlan, Jun Zhao, and Andrew Simpson
2. A Framework to Identify People in Unstructured Environments Incorporating Biometrics
   - Janelle Mason, Prosenjit Chatterjee, Kaushik Roy, and Albert Esterline
3. Continuous Authentication Using Mouse Clickstream Data Analysis
   - Sultan Almalki, Prosenjit Chatterjee, and Kaushik Roy
4. Presentation Attack detection using Wavelet Transform and Deep Residual Neural Net
   - Prosenjit Chatterjee, Alex Yalchin, Joseph Shelton, Kaushik Roy, Xiaohong Yuan, and Kossi D. Edoh

**SpaCCS-W5: UbiSafe Computing**

*Session Chair: Mark Quinlan, University of Oxford*

1. An Approach of ACARS Trajectory Reconstruction Based on Adaptive Cubic Spline Interpolation
   - Zhijun Wu, Shan Tian, Yang Song, Lan Ma, and Meng Yue
2. Task scheduling for streaming applications in a cloud-edge system
   - Fei Yin, Xinjia Li, Xin Li, and Yize Li
3. Lightweight Distributed Attribute Based Keyword Search System for Internet of Things
   - Jiahuan Long, Xiaofen Wang, and Zhang Ke
4. Continuous Objects Detection Based on Optimized Greedy Algorithm in IoT Sensing Networks
   - Jin Diao, Jine Tang, Deng Zhao, and Zhangbing Zhou

**SpaCCS-W6: Cybersecurity Metrics and Risk Modeling**

*Session Chair: Yubao Wu, Georgia State University*

1. Web-based intelligence for IDS
   - Christopher B. Freas, and Robert W. Harrison
2. Cost-Efficient Task Scheduling for Geo-distributed Data Analytics
   - Linfeng Xie, Yang Dai, Yongjin Zhu, Xin Li, Xiangbo Li, and Zhuzhong Qian
3. Predictably Deterrent? The Case of System Trespassers
   - David Maimon, Alexander Testa, Bertrand Sobesto, Michel Cukier, and Wuling Ren
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Geyong Min, University of Exeter, UK
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Jie Wu, Temple University, USA
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Zheng Yan, Aalto University, Finland
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Wanlei Zhou, University of Technology Sydney, Australia
IEEE Congress on Cybermatics 2019
IEEE iThings/GreenCom/CPSCCom/SmartData/Blockchain/SpaCCS-2019
Conference Venue

Sheraton Atlanta Hotel
165 Courtland Street NE Atlanta, Georgia 30303
https://www.marriott.com/event-reservations/reservation-link.mi?id=1550182613628&key=GRP&app=resvlink
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