The 18th IEEE International Symposium on Parallel and Distributed Processing with Applications (ISPA-2020)

The 10th IEEE International Conference on Big Data and Cloud Computing (BDCloud-2020)

The 13th IEEE International Symposium on Social Computing and Networking (SocialCom-2020)

The 10th IEEE International Conference on Sustainable Computing and Communications (SustainCom-2020)

The 19th International Conference on Ubiquitous Computing and Communications (IUCC-2020)

Online Conference, 17-19 December 2020 (Greenwich Mean Time Zone)

Conference Program and Information Booklet

Sponsored by
# Advanced Program Summary (Greenwich Mean Time Zone)

## 17 December 2020 (Thursday)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room 1</th>
<th>Room 2</th>
<th>Room 3</th>
<th>Room 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30-9:00</td>
<td>Opening Ceremony</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:00-9:45</td>
<td>Keynote Speech 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:45-10:30</td>
<td>Keynote Speech 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30-10:40</td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:40-12:40</td>
<td>ISPA-1</td>
</tr>
<tr>
<td>12:40-13:30</td>
<td>Lunch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30-16:00</td>
<td>ISPA-3</td>
</tr>
<tr>
<td>16:00-16:10</td>
<td>Break</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:10-18:40</td>
<td>ISPA-5</td>
</tr>
</tbody>
</table>

## 18 December 2020 (Friday)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room 1</th>
<th>Room 2</th>
<th>Room 3</th>
<th>Room 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30-9:15</td>
<td>Keynote Speech 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:15-10:00</td>
<td>Keynote Speech 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00-10:10</td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:10-12:40</td>
<td>ISPA-7</td>
</tr>
<tr>
<td>12:40-13:30</td>
<td>Lunch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30-15:00</td>
<td>Panel</td>
</tr>
<tr>
<td>15:00-15:10</td>
<td>Break</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:10-17:00</td>
<td>ISPA-8</td>
</tr>
<tr>
<td>17:00-17:10</td>
<td>Break</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:10-19:00</td>
<td>ISPA-9</td>
</tr>
</tbody>
</table>

## 19 December 2020 (Saturday)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room 1</th>
<th>Room 2</th>
<th>Room 3</th>
<th>Room 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30-10:30</td>
<td>ISPA-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30-10:40</td>
<td>Break</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:40-12:40</td>
<td>ISPA-11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:40-13:30</td>
<td>Lunch</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30-15:00</td>
<td>ISPA-12</td>
</tr>
<tr>
<td>15:00-15:10</td>
<td>Break</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:10-17:00</td>
<td>ISPA-13</td>
</tr>
<tr>
<td>17:00-17:10</td>
<td>Break</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:10-19:00</td>
<td>ISPA-14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:40-13:30</td>
<td>Lunch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30-15:00</td>
<td>NGDN</td>
</tr>
<tr>
<td>15:00-15:10</td>
<td>Break</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:10-17:00</td>
<td>IoTBDH</td>
</tr>
<tr>
<td>17:00-17:10</td>
<td>Break</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:10-19:00</td>
<td>SMMA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:40-13:30</td>
<td>Lunch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30-15:00</td>
<td>NGDN</td>
</tr>
<tr>
<td>15:00-15:10</td>
<td>Break</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:10-17:00</td>
<td>IoTBDH</td>
</tr>
<tr>
<td>17:00-17:10</td>
<td>Break</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:10-19:00</td>
<td>SMMA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:40-13:30</td>
<td>Lunch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30-15:00</td>
<td>NGDN</td>
</tr>
<tr>
<td>15:00-15:10</td>
<td>Break</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:10-17:00</td>
<td>IoTBDH</td>
</tr>
<tr>
<td>17:00-17:10</td>
<td>Break</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:10-19:00</td>
<td>SMMA</td>
</tr>
</tbody>
</table>
Presentation Guidelines

**Conference Date**
The conference is to be held from Dec 17-19, 2020. The time for conference program is based on **GMT, Greenwich Mean Time**.

**For Session Chairs**
Session Chairs are requested to join the zoom at least 10 minutes before their session.

**For Authors**
You are strongly encouraged to join the zoom during your presentation and Q&A. Please confirm your attendance with the Session Chair at least 10 minutes before the session.

**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 ISPA/BDCloud/SocialCom/SustainCom/IUCC-2020 paper presentations use **20 minutes presentation time plus 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.

**Online Conference Venue**
The congress will be held online via four zooms, which can be accessed via the following links:

**Room 1:** Meeting ID: 913 0668 4125  
Invitation Link: [https://zoom.us/j/91306684125?pwd=S0VrOUdSNG9YcEcwK280SW1qS0NEZz09](https://zoom.us/j/91306684125?pwd=S0VrOUdSNG9YcEcwK280SW1qS0NEZz09)

**Room 2:** Meeting ID: 993 1490 0725  
Invitation Link: [https://zoom.us/j/99314900725?pwd=ZzBHcvpJaFhQktGcU5zEd54zd09](https://zoom.us/j/99314900725?pwd=ZzBHcvpJaFhQktGcU5zEd54zd09)

**Room 3:** Meeting ID: 926 0383 0692  
Invitation Link: [https://zoom.us/j/92603830692?pwd=VkhaT3FYW5LZmFYdTEbmg3d3FjUT09](https://zoom.us/j/92603830692?pwd=VkhaT3FYW5LZmFYdTEbmg3d3FjUT09)

**Room 4:** Meeting ID: 963 2739 5457  
Invitation Link: [https://zoom.us/j/96327395457?pwd=bENpSGZuZfJdGZ2WWxlcHV3NktHUT09](https://zoom.us/j/96327395457?pwd=bENpSGZuZfJdGZ2WWxlcHV3NktHUT09)

It is recommended to join your interested room via the web-based zoom (see the instruction below), especially for those who don’t have a zoom account or cannot use the zoom app for free.

After typing a link into your browser, click “Join from Your Browser” on your webpage and you will be joining the conference for free. In the event that the meeting passcode is required, please type **202012** for all above rooms.

During each presentation, you can type your question(s) in the zoom. After the presentation, the session chair will ask the questions on behalf of you.

Beyond the online congress, you can replay any presentation by clicking the link in the program, which will lead you into the slack for replaying your selected representations. To do this, **please join the following two slack workspaces:**

[https://join.slack.com/t/exeterconference202020/shared_invite/zt-k0zyu1jn-erApxH6MwmgMJ4IxD_4QlemQ](https://join.slack.com/t/exeterconference202020/shared_invite/zt-k0zyu1jn-erApxH6MwmgMJ4IxD_4QlemQ)

[https://join.slack.com/t/ispa-2020/shared_invite/zt-jx1s2z9e-WBQYpZ_i7UUTEHXe7mA6qg](https://join.slack.com/t/ispa-2020/shared_invite/zt-jx1s2z9e-WBQYpZ_i7UUTEHXe7mA6qg)

Just notice that please don’t upload any files into slack, which will squeeze out the presentations. For any assistance, please contact conference.register2020@gmail.com.
**Table of Contents**

Advanced Program Summary (Greenwich Mean Time Zone) ........................................... 2

Keynote Speech 1 .................................................................................................................. 3

Keynote Speech 2 .................................................................................................................. 4

Keynote Speech 3 .................................................................................................................. 5

Keynote Speech 4 .................................................................................................................. 6

2020 IEEE ISPA/BDCloud/SocialCom/SustainCom/IUCC Joint Plenary Panel Session ............................................................ 7

Part I: TECHNICAL SESSIONS OF ISPA-2020 and Associated Workshops/Symposia ............................................................ 8

  ISPA-2020 TECHNICAL SESSIONS .............................................................................. 8
  MLfuNet-2020 TECHNICAL SESSIONS ................................................................... 13
  NGDN-2020 TECHNICAL SESSIONS ....................................................................... 13
  AISys-2020 TECHNICAL SESSIONS ....................................................................... 14
  IoTBDH-2020 TECHNICAL SESSIONS ................................................................... 14

Part II: TECHNICAL SESSIONS OF BDCloud-2020 ....................................................... 15

  BDCloud-2020 TECHNICAL SESSIONS .................................................................. 15

Part III: TECHNICAL SESSIONS OF SocialCom-2020 and Associated Workshops/Symposia .................................................................................. 15

  SocialCom-2020 TECHNICAL SESSIONS ................................................................. 15
  SMMA-2020 TECHNICAL SESSIONS ...................................................................... 16
  DSONAM-2020 TECHNICAL SESSIONS ................................................................ 17

Part IV: TECHNICAL SESSIONS OF SustainCom-2020 .................................................. 17

  SustainCom-2020 TECHNICAL SESSIONS .............................................................. 17

Part V: TECHNICAL SESSIONS OF IUCC-2020 ............................................................... 18

  IUCC-2020 TECHNICAL SESSIONS ...................................................................... 18
Keynote Speech 1

Aeronautical Ad-Hoc Networking for the Internet-above-the-clouds

Prof. Lajos Hanzo

University of Southampton, UK

Abstract

As a promising system-architecture, an integrated terrestrial, UAV-aided, airplane-assisted as well as satellite-based global coverage-solution and its enabling techniques will be highlighted as a further step towards the provision of seamless global coverage.

An open scientific challenge is that of striking the most appropriate trade-off amongst the conflicting performance metrics of throughput, transmit power, latency, error probability - just to name a few. The 5G system meets this challenge by introducing three modes of operations, namely the enhanced Mobile BroadBand (aMBB), the Ultra Reliable Low-Latency Communications (URLLC) and the massive Machine Type Communications (mMTC) modes.

However, further research is required for finding all the optimal operating points of wireless systems with the aid of sophisticated multi-component system optimization, leading to the Pareto-front of all optimal solutions.

Biography

Lajos Hanzo is a Fellow of the Royal Academy of Engineering (FREng), FIEEE, FIET and a EURASIP Fellow, Foreign Member of the Hungarian Academy of Science. He holds honorary Doctorates from the University of Edinburgh and the Technical University of Budapest. He co-authored 19 IEEE Press - JohnWiley books and 1900+ research contributions at IEEE Xplore. For further information on his research in progress and associated publications please refer to IEEE Xplore.
Keynote Speech 2

Bad Data Analysis in An Era of Big Data

Prof. Zidong Wang
Brunel University London, UK

Abstract

In this talk, we discuss another side of big data analysis, bad data analysis, where the badness means the complexities resulting in the reproducibility issues. Some background knowledge is first introduced on the volatility of the big data analysis, which shows 1) “big” does not necessarily mean “better” and 2) the so-called multi-objective data analysis (against badness) is vitally important in advancing the state-of-the-art. Two examples are used for demonstration of the big data analysis, one for big data from complex networks and the other for big data from gene expression image processing. Finally, conclusions are drawn and some future directions are pointed out.

Biography

Dr. Zidong Wang is currently Professor of Dynamical Systems and Computing in the Department of Computer Science, Brunel University London, U.K. From 1990 to 2002, he held teaching and research appointments in universities in China, Germany and the UK. Prof. Wang's research interests include dynamical systems, signal processing, bioinformatics, control theory and applications. He has published 250+ papers in IEEE Transactions and 60+ papers in Automatica with an H-index of 120. He is a holder of the Alexander von Humboldt Research Fellowship of Germany, the JSPS Research Fellowship of Japan, William Mong Visiting Research Fellowship of Hong Kong.

Prof. Wang serves (or has served) as the Editor-in-Chief for Neurocomputing, the Deputy Editor-in-Chief for International Journal of Systems Science, and an Associate Editor for 12 international journals including IEEE Transactions on Automatic Control, IEEE Transactions on Control Systems Technology, IEEE Transactions on Neural Networks, IEEE Transactions on Signal Processing, and IEEE Transactions on Systems. Man, and Cybernetics-Part C. He is a Member of the Academia Europaea, a Fellow of the IEEE, a Fellow of the Royal Statistical Society and a member of program committee for many international conferences.
**Federated Learning Systems: A New Holy Grail for System Research in Data Privacy and Protection?**

Prof. Bingsheng He  
*National University of Singapore, Singapore*

**Abstract**

Federated learning has been a hot research area in enabling the collaborative training of machine learning models among different organizations under the privacy restrictions. As researchers try to support more machine learning models with different privacy-preserving approaches, there is a requirement in developing systems and infrastructures to ease the development of various federated learning algorithms. Just like deep learning systems such as Caffe, PyTorch, and Tensorflow that boost the development of deep learning algorithms, federated learning systems are equivalently important, and face challenges from various issues such as unpractical system assumptions, scalability and efficiency. Inspired by federated systems in other fields such as databases and cloud computing, we study the system design requirements for federated learning systems. We find that two important features for federated systems in other fields, i.e., heterogeneity and autonomy, are rarely considered in the existing federated learning systems. In this talk, we will take a systematic comparison among the existing federated learning systems and present our research progress and future system research opportunities and directions.


**Biography**

Dr. Bingsheng He is currently an Associate Professor and Vice-Dean (Research) at School of Computing, National University of Singapore. Before that, he was a faculty member in Nanyang Technological University, Singapore (2010-2016), and held a research position in the System Research group of Microsoft Research Asia (2008-2010), where his major research was building high performance cloud computing systems for Microsoft. He got the Bachelor degree in Shanghai Jiao Tong University (1999-2003), and the Ph.D. degree in Hong Kong University of Science & Technology (2003-2008). His current research interests include cloud computing, database systems and high performance computing. His papers are published in prestigious international journals (such as ACM TODS and IEEE TKDE/TPDS/TC) and proceedings (such as ACM SIGMOD, VLDB/PVLDB, ACM/IEEE SuperComputing, ACM HPDC, and ACM SoCC). He has been awarded with the IBM Ph.D. fellowship (2007-2008) and with NVIDIA Academic Partnership (2010-2011). Since 2010, he has (co-)chaired a number of international conferences and workshops, including IEEE CloudCom 2014/2015, BigData Congress 2018 and ICDCS 2020. He has served in editor board of international journals, including IEEE Transactions on Cloud Computing (IEEE TCC), IEEE Transactions on Parallel and Distributed Systems (IEEE TPDS), IEEE Transactions on Knowledge and Data Engineering (TKDE), Springer Journal of Distributed and Parallel Databases (DAPD) and ACM Computing Surveys (CSUR). He has got editorial excellence awards for his service in IEEE TCC and IEEE TPDS in 2019.
**Keynote Speech 4**

**New Generation of Internet of Things Architecture, Services and Ecosystems**

Nektarios Georgalas  
*British Telecom, UK*

**Abstract**

The Internet of Things (IoT) aims at connecting myriads of data collecting devices deployed at physical locations in the field. Traditionally, a custom set of such devices would collect data sets specifically targeted to one type of application usually hosted in the cloud; another application would require another set of sensors and so on, thus leading to stove-piped solutions and introducing major management complexity. The Data Exchange paradigm aims at a horizontal approach, where sensors collect data which becomes a reusable resource among a plurality of applications removing the dedicated sensor-data-app vertical model. Moreover, modern data processing techniques including AI, machine learning and a variety of different analytics, such as video analytics, drives the development of innovative IoT applications and services which, due to Data Exchange, may combine, correlate and analyse data from more than one source driving higher value insights from low-level data. Another noteworthy dimension is introduced by the “IoT Continuum”. IoT Continuum characterises the spread of hosting compute infrastructures from the very customer edge, where devices are situated such as general-purpose gateways, the network edge, e.g., 5G MEC nodes, all the way to the cloud, and anywhere in between the edge and cloud ends where compute nodes are available. These new techniques driving IoT service development as well as the IoT Continuum define the New Generation of IoT Architecture (NG-IoTA), on which this talk will be focusing. We will present a set of architectural principles underpinning NG-IoTA, talk about the manifestation of these principles in various solutions regarding Edge Computing, orchestration, IoT analytics, service management and their application in a few use-cases offering real world example implementations of these capabilities.

**Biography**

Nektarios Georgalas is a Principal Researcher at British Telecom's Research and Innovation department. In his current role, he is Director of the BT/Intel and the BT/Huawei Co-labs, two collaborative research programmes with key BT partners delivering innovations in the areas of Cloud, Data Centres, Network Virtualisation, Smart Cities, IoT and Mobility. During his career with BT, since 1998, he has managed numerous collaborative and internal research projects in areas such as network management, market-driven data management systems, policy-based management, distributed information systems, SOA/Web Services, Model Driven Design and Development of telecoms OSS, Cloud and NfV. Nektarios has led numerous international collaborations on the application of advanced techniques for design, development and operation of telecoms Networks and Operation Support Systems environments. In the past he was very active leading and contributing to key programmes within the TeleManagement Forum, where he established international standards teams, led Catalysts and influenced the Forum's strategy towards a model-driven and software-defined ecosystem of digital services in dynamic marketplaces; most recently he is involved in TMF’s Smart City Forum and related Catalysts. His work has been recognised several times by numerous international awards including the TMForum's "Excellence Award for Innovation" 2010, "Most Innovative Catalyst Award" 2014, "Best New Catalyst Award" 2015 and "Most Significant Contribution to Frameworx Award" 2015, “Most Innovative Catalyst – Smart X Commercial” 2016, “Outstanding Performance in the Catalyst Programme” 2017 and “Smart City Innovator of the Year” Excellence Award 2017. Other recognition accolades include Global Telecoms Business's "Business Service Innovation Award" 2010, 2012 and 2013. He has been Finalist in UK IT Industry Award for "Best IT Innovation" in 2013 and Highly Commended for the IET Innovation Award for Telecommunication in 2009. He has also achieved "Best innovation for Large Enterprise" and "Best Customer Experience Innovation" Finalists in BT Innovation Awards 2010. Nektarios has been recognised in BT's TSO "Brilliant People" 2015. Nektarios is inventor and co-inventor of 12 patents. He has also authored more than 70 papers in international journals and conferences and served as guest editor in the areas of IoT, Big Data and Data Science in highly recognised international journals including IEEE. He has served as General Co-chair, Programme Co-Chair, Programme Committee and Keynote Speaker and Invited Panellist in top international IEEE academic and TMForum conferences.
2020 IEEE ISPA/BDCloud/SocialCom/SustainCom/IUCC Joint Plenary Panel Session

Artificial Intelligence of Things (AIoT) and Smart Edge Computing

Abstract

The convergence of Internet-of-Things and Artificial Intelligence leads to a brand-new technology landscape, Artificial Intelligence of Things (AIoT), which is set to make significant impacts to the sectors of smart home, smart city, and smart industry. Meanwhile, the advent of intelligent edge computing enables real-time insights by big data processing at the network edge, close to various IoT devices. Intelligent edge computing is envisaged to transform the AIoT applications and push the boundaries of data processing and machine learning. Hence, how to achieve Artificial Intelligence of Things (AIoT) and Smart Edge Computing systems becomes a major objective for researchers and practitioners.

The panelists in this panel have diverse backgrounds with outstanding research accomplishments are invited to present their opinions on the challenges and strategies to achieve the objective of having AIoT and Smart Edge Computing systems. The session will then be open for discussions from the floor.

Panelist:  
- Prof. Ashiq Anjum, University of Leicester, UK
- Prof. Liangxiu Han, Manchester Metropolitan University, UK
- Prof. Lu Liu, University of Leicester, UK
- Prof. Omer Rana, Cardiff University, UK
- Prof. Rajiv Ranjan, Newcastle University, UK
- Dr. Shiqiang Wang, IBM Thomas J. Watson Research Center, USA
## Part I: TECHNICAL SESSIONS OF ISPA-2020 and Associated Workshops/Symposia

### ISPA-2020 TECHNICAL SESSIONS

**17 December 2020 Thursday**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session ISPA-1: Parallel Computing and Data Storage (I) (Room-2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:40-12:40</td>
<td>Session Chair: Xu Zhang, Nanjing University, China&lt;br&gt;Reinforced Keyphrase Generation with BERT-based Sentence Scorer&lt;br&gt;Rui Liu, Zheng Lin, Peng Fu, Weiping Wang&lt;br&gt;SOG-Based Multi-Core LTL Model Checking&lt;br&gt;Chiheb Ameur Abid, Kais Klai, Jaime Arias, Hiba Ouni&lt;br&gt;A Task Execution Framework Based on Aging Indicator and SARIMI&lt;br&gt;Minghao Tang, Peng Zhang, Haoqi Sun, Lei Zhang&lt;br&gt;Framework-Agnostic Optimization of Repeated Skewed Joins at Massive Scale&lt;br&gt;Andrea Nardelli, Vladimir Vlassov, Amir H. Payberah&lt;br&gt;Parallel Computing and Optimization of Lattice Boltzmann Method Based on SW26010 Processor&lt;br&gt;Xiaoxiao Zhang, Liangjun Wang, Xuesen Chu, Hu Ding, Wu Zhang&lt;br&gt;A tile assembly model to calculate point-multiplication on conic curves over finite field GF(2^n)&lt;br&gt;Yongnan Li</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Session ISPA-2: Recommendation, Planning, and Prediction (Room-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:40-12:40</td>
<td>Session Chair: Feng Wei, York University, Canada&lt;br&gt;A recommendation algorithm for sparse data via implicit relationship&lt;br&gt;Miao Xie, Shijun Liu, Li Pan&lt;br&gt;A Hybrid Recommendation Algorithm with Short-term Preference and Knowledge Preference&lt;br&gt;Jia-le Li, Zhi-juan Du, Jian-tao Zhou&lt;br&gt;A Web API Recommendation Method with Composition Relationship Based on GCN&lt;br&gt;Yangqi Zhang, Haiyang Yang, Li Kuang&lt;br&gt;A UAV Path and Action Planning Algorithm for Indoor Localization Information Collection&lt;br&gt;Zijie Wang, Liang Liu, Jiankang Xu, Li Zeng&lt;br&gt;Efficient Multi-Request Route Planning on Road Network&lt;br&gt;Jiajia Li, Jiahui Hu, Lei Li, Xing Xiong, Xiufeng Xia&lt;br&gt;An efficient dynamic neural network for predicting time series data stream&lt;br&gt;Liang Chen, Wei Wang, Yun Yang&lt;br&gt;Predicting Residual Stress by Finding Peak Shape Using Artificial Neural Networks&lt;br&gt;Liu Yang, Junyu Zhang, Tingxuan Chen, Wuji Lei, Xiaolong Liu</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Session ISPA-3: Parallel Computing and Data Storage (II) (Room-2)</th>
</tr>
</thead>
</table>
Mingming Ren, Xiaomin Huang, Zhuofeng Wu, Rebecca J. Stones, Xiaoguang Liu, Gang Wang

ptlbmalloc2: Reducing TLB Shootdowns with High Memory Efficiency
Stijn Schildermans, Jianchen Shan, Xiaoning Ding

Dependent and Heterogeneous Process Migration Based on Checkpoints
Na Yang, Xia Wang, Yun Wang, Qi Zhai

A Unified Page Walk Buffer and Page Walk Cache
Dunbo Zhang, Chaoyang Jia, Qiong Wang, Li Shen

Live Container Migration via Pre-restore and Random Access Memory
Zhixing Yu, Kejing He, Chao Chen, Jian Wang

13:30-16:00 Session ISPA-4: Scheduling and Load Balancing (Room-3)
Session Chair: Hong Zhu, Oxford Brookes University, UK
Task Merging Based on Scenarios of Functionally Unique Resources for Deadline-Constrained Workflow Scheduling
Pingping Li, Haopeng Chen

APCC: Agile and Precise Congestion Control in Datacenters
Renjie Zhou, Guoyuan Yuan, Dezun Dong, Shan Huang

NVMCache: Wear-Aware Load Balancing NVM-based Caching for Large-Scale Storage Systems
Zhenhua Cai, Jiayun Lin, Fang Liu, Zhiguang Chen, Hongtao Li

Resource Scheduling Algorithm on Mobile P2P Distribution Networks
Doudou Wang, Xin Hu, Quan Xue, Ze Li, Lexi Xu, Weidong Wang

A Novel Influence Maximization-based Dynamic Forwarding Node Selection Scheme in SDVNs
Liang Zhao, Tong Zheng, Mingwei Lin, Ammar Hawbani, Jiaxing Shang

Performance Modeling of a General GPS Scheduling Under Long Range Dependent Traffic
Ran Zhang, Lei Liu, Xudong Lu, Zhongmin Yan, Hui Li

Game-Based Negotiation between Power Demand and Supply in Green Datacenters
Minh-Thuyen Thi, Jean-Marc Pierson, Georges Da Costa

16:10-18:40 Session ISPA-5: Accelerating Deep Neural Networks (Room-2)
Session Chair: Kostas Kolomvatsos, University of Thessaly, Greece
A Fast Robustness Quantification Method for Evaluating Typical Deep Learning Models by Generally Image Processing
Haocong Li, Yunjia Cheng, Wei Ren, Tianqing Zhu

DLFusion: An Auto-Tuning Compiler for Layer Fusion on Deep Neural Network Accelerator
Zihan Liu, Jingwen Leng, Quan Chen, Chao Li, Wenli Zheng, Li Li, Minyi Guo

Parallel Variational Autoencoders for Multiple Responses Generation
Miaojin Li, Peng Fu, Zheng Lin, Weiping Wang

Characterizing the I/O Pipeline in the Deployment of CNNs on Commercial Accelerators
Jiansong Li, Zihan Jiang, Fangxin Liu, Xiaoping, Guangli Li, Xueying Wang, Wei Cao, Lei Liu, Yanzhi Wang, Tao Li, Jianfeng Zhan, Xiaobing Feng

DCDFNE: build dataset to evaluate binary codes diffing tools and train deep learning models
Ke Zhan, Zhonghua Lu, BingChang Liu

APENAS: An Asynchronous Parallel Evolution Based Multi-Objective Neural Architecture Search
Mengtiao Hu, Li Liu, Wei Wang, Yao Liu

FPGA Implementation of MobileNetV2 CNN Model Using Semi-Streaming Architecture for Low Power Inference Applications
Nazariy K. Shaydyuk, Eugene B. John

16:10-18:40 Session ISPA-6: Learning Systems and Applications (Room-3)
Session Chair: Xu Zhang, Nanjing University, China

Improved Human Activity Recognition Model based on Sequence Mixup
Ran Tan, Xuefeng Yan

An Ego Network Embedding Model via Neighbors Sampling and Self-attention Mechanism
Ziyu Guo, Shijian Liu, Li Pan, Qiang He

User Preference Excitation Network for Sequential Recommendation
Jiong Wang, Yingshuai Kou, Neng Gao, Chenyang Tu

Remote Procedure Call Optimization of Big Data Systems Based on Data Awareness
Jin Wang, Yaqiong Yang, Jingyu Zhang, Lei Wang

Feature Envy Detection based on Bi-LSTM with Self-Attention Mechanism
Hongze Wang, Jing Liu, JieXiang Kang, Wei Yin, Haiying Sun, Hai Wang

Global Context-aware Representation for Implicit Discourse Relation Recognition
Meilin Zhou, Qi Liang, Peng Zhang, Lu Ma, Dan Luo, Bin Wang

Honeyeve: A Network Traffic Collection Framework for Distributed ICS Honeynets
Chuan Sheng, Yu Yao, Dongbiao Li, Hongna An, Wei Yang

18 December 2020 Friday

10:10-12:40  Session ISPA-7: Graph Neural Networks and Graph Algorithms (Room-2)

Session Chair: Zhengxin Yu, University of Exeter, UK

Multi-Relational Graph Convolutional Networks for Skeleton-Based Action Recognition
Fang Liu, Qin Dai, Shengze Wang, Liang Zhao, Xiangbin Shi, Jianzhong Qiao

NarrGNN: Narrative Graph Neural Networks for New Script Event Prediction Problem
Shuang Yang, Fali Wang, Daren Zha, Cong Xue, Zhihao Tang

Social Recommendation based on Graph Neural Networks
Hongji Sun, Lili Lin, Riqing Chen

Effectively Refining Parameters for Unexpected Nodes on Structural Graph Clustering
Chuanyu Zong, Chengwei Zhang, Xiufeng Xia, Tao Qiu, Jiaying Wang

Effectively Explaining Missing Nodes on Structural Graph Clustering
Xiufeng Xia, Jida Min, Chuanyu Zong, Jiajia Li, Xiangyu Liu, Tao Qiu

A Span-based Model for Joint Entity and Relation Extraction with Relational Graph
Xingang Wang, Dong Wang, Fengpo Ji

Answer Graph-based Interactive Attention Network for Question Answering over Knowledge Base
Lu Ma, Peng Zhang, Dan Luo, Meilin Zhou, Qi Liang, Bin Wang

Effectively Incremental Structural Graph Clustering for Dynamic Parameter
Chuanyu Zong, Xiufeng Xia, Chao Xian, Anzhen Zhang, Rui Zhu, Jiaying Wang

15:10-17:00  Session ISPA-8: Cloud Computing Infrastructure and Applications (Room-2)

Session Chair: Wang Miao, University of Exeter, UK

Cost-Efficient Request Dispatching in Geo-distributed Cloud Gaming Infrastructure
Yusen Li, Jinning Wu, Bingzheng Ma, Gang Wang, Xiaoguang Liu

A New Paradigm of Cloud Brokerage
Sreekrishnan Venkateswaran, Santonu Sarkar

Comat: An Effective Composite Matching Framework for Content-based Pub/Sub Systems
Tianchen Ding, Shiyou Qian, Weidong Zhu, Jian Cao, Guangtao Xue, Yanmin Zhu, Wenjuan Li

Demystifying the Largest Live Game Streaming Platform via Black-Box Measurement
Secure Spatio-textual Skyline Queries on Cloud Platform
Yiping Teng, Dan Liu, Xiaoting Liu, Wenyu Zhao, Haigang Liu, Chunlong Fan

Scaleplus: Towards Fast Scaling of Distributed Streaming Dataflows
Zan Zong, Lijie Wen, Xiao Liu, Li Lin, Chen Qian, Leilei Lin

17:10-19:00 Session ISPA-9: Blockchain and Data Sharing (Room-2)
Session Chair: Wang Miao, University of Exeter, UK
TSSN: A Trusted Shared Storage Network Based on Blockchain and Bilateral Matching
Shuokang Huang, Maoyu Du, Wei Li, Kai Lei

Blockchain-based Access Control Mechanism of Federated Data Sharing System
Yan Ding, Liaoliao Feng, Ying Qin, Pan Dong, Chenglin Huang, Long Gao, Yusong Tan

Multi-layer Access Control Mechanism based on Blockchain for Mobile Edge Computing
YiChen Hou, WenXin Liu, Hui Lin, XiaoDing Wang

A cross-blockchain based distributed crowdsourcing system for Internet of Things
Min Peng, QinYang Miao, Hui Lin, XiaoDing Wang

An Systematic Study on Blockchain Transaction Databases Storage and Optimization
Jingyu Zhang, Siqi Zhong, Jin Wang, Lei Wang

Revisiting the Fairness and Randomness of Delegated Proof of Stake Consensus Algorithm
Qi Wang, Ming Xu, Xiangxue Li, Haifeng Qian

19 December 2020 Saturday

8:30-10:30 Session ISPA-10: Security and Reliability (I) (Room-2)
Session Chair: Karri Chiranjeevi, University of Beira Interior, Covilhã, Portugal
Privacy Preserving Trajectory Data Publishing with Personalized Differential Privacy
Ruxue Wen, Wenqing Cheng, Haojun Huang, Wang Miao, Chen Wang

Constructing Optimal Sparse Decision Tree for Analyzing I-SIG System Attack
Xiaojin Wang, Yingxiao Xiang, Wenjia Niu, Endong Tong, Qi Alfred Chen, Gang Li, Jiqiang Liu, Long Li

Fusion-based Spammer Detection Method by Embedding Review Texts and Weak Social Relations
Jie Wen, Jingyu Huang, Hongbin Shi, Xin Wang, Jizhong Han, Tao Guo

AVDHRA: Automated Vulnerability Detection based on Hierarchical Representation and Attention Mechanism
Wenyuan An, Liwei Chen, Jinxin Wang, Gewangzi Du, Gang Shi, Dan Meng

Secure deduplication method based on autoencoder
Hai Qi, Tianwei Lu, Ligang Cong, Xiaojing Yang

Toward Automatic Mobile Application Fingerprint Extraction from Non-encrypted HTTP Traffic
Yafei Sang, Yan Xu, Yongzheng Zhang, Peng Chang, Shuyuan Zhao, Yijing Wang

10:40-12:40 Session ISPA-11: Security and Reliability (II) (Room-2)
Session Chair: Aneta Poniszewska-Maranda, Lodz University of Technology, Poland
Atomic Restriction: Hardware Atomization to Defend Against Preemption Attacks
Yaosong Lu, Weijie Liu, Wenhao Wang

Analysis of security methods in Vehicular Ad-Hoc Network against Worm Hole and Gray Hole attacks
Krzysztof Stepien, Aneta Poniszewska-Maranda

Hardware Implementation of Security Association Lookup Device Based on RAM
Dongfang Li, Yasha Chen, Shuai Zhang, Wei Shen, Guang Yang
Low-rate DoS Attack Detection Based on WPD-EE Algorithm
Xiaocai Wang, Qiuwei Yang, Zichao Xie, Zhiqing Zheng, Yudong Yan, Dan Tang

ASPGen: an Automatic Security Policy Generating Framework for AppArmor
Yun Li, Chenglin Huang, Lu Yuan, Yan Ding, Hua Cheng

A Simulation-based Study on the Reliability of Data Center Upgrades
Yichuan Qi, Dan Feng, Bining Hou, Fang Wang, Jianxi Chen, Yun Liu

IntruDTS: Interactive Visual Analysis System for Intrusion Detection in Time Series
Xuefei Tian, Chenlu Li, Aijuan Qian, Xiaoju Dong

13:30-15:00  Session ISPA-12: Intelligent Algorithms and Optimization (Room-2)
Session Chair: Karri Chiranjeevi, University of Beira Interior, Covilhã, Portugal
An Improved Sparrow Search Algorithm
Wei Song, Song Liu, Xiaochun Wang, Weiguo Wu

Highly Efficient and GPU-Friendly Implementation of BFS on Single-node System
Rongyu Dong, Huawei Cao, Xiaochun Ye, Yuan Zhang, Qinfen Hao, Dongrui Fan

DE-CO: A Two-Step Spelling Correction Model for Combating Adversarial Typos
Zhengxiao Liu, Fali Wang, Zheng Lin, Lei Wang, Zhiyi Yin

Joint extraction of triple knowledge based on relation priority
Chuanzhi Zhuang, Ningyu Zhang, Xiaoling Jin, Zhong Li, Shumin Deng, Huajuan Chen

A simple function embedding approach for binary similarity detection
Weilong Li, Shuyuan Jin

15:10-17:00  Session ISPA-13: Crowd Science and System Demo (Room-2)
Session Chair: Kostas Kolomvatsos, University of Thessaly, Greece
Multi-interest Aware Recommendation in Crowdintell Network
Yixin Zhang, Wei He, Lizhen Cui, Lei Liu, Zhongmin Yan

Encrypted Network Traffic Classification: A data driven approach
Zhongkai Zhang, Lei Liu, Xudong Lu, Zhongmin Yan, Hui Li

Task Assignment with Consensus Decision for Spatial Crowdsourcing
Xiaomeng Lian, Wei He, Lizhen Cui, Hui Li, Lei Liu

Crowd Intelligence Empowered Video Transmission in Ultra-low-bandwidth Constrained Circumstances
Hexiang Qiao, Zheming Yang, Bing Liang, Wen Ji

Understanding Crowd Intelligence in Large-scale Systems: A Hierarchical Binary Particle Swarm Optimization Approach
Linqing Zhai, Zheming Yang, Wen Ji

17:10-19:00  Session ISPA-14: Multi-Access Edge Computing and Edge Networks (Room-2)
Session Chair: Kostas Kolomvatsos, University of Thessaly, Greece
Caching Resource Allocation and Mobility Aware in Information-Centric Networking with Mobile Edge Computing
Daud Khan, Haopeng Chen, Najamul Din

Towards 6G Joint HAPS-MEC-Cloud 3C Resource Allocation for Delay-Aware Computation Offloading
Yang Yang, Xiaolin Chang, Ziye Jia, Zhu Han, Zhen Han

PCRec: A Private Coding Computation Scheme Based on Edge Computing for Recommendation System
Mengjia Zhai, Fei Gu, Jin Wang, Lingzhi Li, Kejie Lu, Jianping Wang

MCSEC: Secure Coded Matrix Multiplication Scheme for Edge Computing with Minimum Communication Cost
Tingting Dong, Jin Wang, Fei Gu, Jingya Zhou, Kejie Lu, Jianping Wang

A Deep Reinforcement Learning based Mobile Device Task Offloading Algorithm in MEC
MLFuNet-2020 TECHNICAL SESSIONS
18 December 2020 Friday

10:10-12:40  Session MLFuNet: Machine Learning Empowered Future Network (Room-4)
Session Chair: Lexi Xu, ChinaUnicom, China
Invited talk: Machine Learning for Communication and Network Data Processing
Chunbo Luo, University of Exeter, UK
Price Learning in Joint Resource Allocation and Power Control Game in Heterogeneous Cellular Networks
Chen Sun, Bo Zhang, Wei Zheng, Jian Shu
Capacity Enhancement in LTE Network based on Machine Learning
Jinge Guo, Zhongsheng Fan, Yang Zhang, Huangtao Song, Bao Guo
Dynamic Beam Hopping of Multi-beam Satellite Based on Genetic Algorithm
Libing Wang, Xin Hu, Shijun Ma, Sujie Xu, Weidong Wang
An Improved Energy Saving Strategy for SDN-based Data Center
Peng HongYu, Xiao HanLiang, Hao TianLu, Wang Kan, Chen ZhenKai, Xu LeXi
An Energy Efficiency Strategy Based on Bayesian Classification in SDN DataCenter
Xiao HanLiang, Peng HongYu, Gong Sha
An improved firework algorithm based on local search optimization
Gong Sha, Peng HongYu, Dai Qi, Xiao HanLiang
Recognition and Optimization of Atmospheric Duct in TD-LTE System Based on Convolutional Neural Network
Jin-Hu Shen, Ji-Xiang Liu, Jing-Lei Zuo, Wen-Bo Ding, Ao Shen, Yuan Fang, Yang Zhang, Xi-Dian Wang, Feng Luo
Design of Performance Benchmark for Time Series Databases
Miaoqiong Wang, Siyuan Liu, Kai Wei, Han Liu, Chunyu Jiang, Shu Yan, Pengwei Ma

NGDN-2020 TECHNICAL SESSIONS
19 December 2020 Saturday

13:30-15:00  Session NGDN: Next Generation Data-driven Networks (Room-3)
Session Chair: Liang Zhao, Shenyang Aerospace University
Invited talk: Robust Beamforming Design in 5G-enabled UAV Communication Systems
Wang Miao, University of Exeter, UK
Mobile Edge Computing for Intelligent Mining Safety: A Case Study of Ventilator
Yuchun Zhang, Liang Zhao, Kaiqi Yang, Lexi Xu
A Review of Routing Protocols for Wireless Body Area Networks for Miner Safety
Yuchun Zhang, Liang Zhao, Jiaxing Shang, Junling Shi, Su Peng, Yunchong Guan
A Practical Workflow in Cleaning Master Data
Shuang Yi, Hailiang Ye
PORA: Piggybacking-based Opportunistic Routing for Asynchronous Duty-Cycled WSNs
Weiqi Wu, Xingfu Wang, Ammar Hawbani, Taiyaba Qureshi

13
13:30-15:00 Session AISys-1: Al-driven Smart System (I) (Room-4)
Session Chair: Lexi Xu, ChinaUnicom, China
Invited talk: Digital Twinning for Intelligent Network Management
Yulei Wu, University of Exeter, UK
Challenges and Opportunities for Terrestrial Network Operators in the Air-Space-Ground Integrated Network
Yushan Pei, Shouye Miao, Fuchang Li
Exemplar Loss for Siamese Network in Visual Tracking
Shuo Chang, Hua Lu, Sai Huang, Yifan Zhang
An Improved Small-world Topology for Optimizing the Performance of Echo State Network
Gong Sha, Peng HongYu, Dai Qi, Xiao HanLiang, Chen ZhenKai, Hao TianLu
Research and Application of AI in 5G Network Operation and Maintenance
Mingsxin Li, Mingde Huo, Xinzhou Cheng, Lexi Xu
Research on Infrastructure Project Financial System based on Power Grid Big Data
Zhendong Li, Danwei Zhou, Xiangyang Zheng
An Improved Data Discretization Algorithm based on Rough Sets Theory
Han Liu, Chunyu Jiang, Miaqiong Wang, Kai Wei, Shu Yan

15:10-17:00 Session AISys-2: Al-driven Smart System (II) (Room-4)
Session Chair: Lexi Xu, ChinaUnicom, China
Invited talk: Mobile Multi-hop Networking and Computing for Beyond 5G
Liang Zhao, Shenyang Aerospace University, China
State of Charge Estimation of Low-speed Electric Vehicle Battery using Back Propagation Neural Network
Menglong Xu, Wenguang Wu, Wenwen Zhou, Yuanyuan Ma, Xiaolei Shi, Jun Li
Research on Energy Dispatching Strategy Based on Energy Forecast Algorithm for Data Center
Hanliang Xiao, Hongyu Peng, Sha Gong, Lexi Xu
A Novel 5G Core Network Capability Exposure Method for Telecom Operator
Lin Lin, Bin Zhu, Quangquan Wang, Lexi Xu, Jia Mu
Research on Intelligent Optimization of Massive MIMO Coverage Based on 5G MR
Guoping Xu, Tian Xiao, Tao Tao, Duo Zhang, Wei Li, Hongbing Ma
5G Core Network Framework Based on Artificial Intelligence
Shiyu Zhou, Xiqing Liu, Dengsheng Fu, Xinzhou Cheng, Bin Fu, Zhengjiao Zhao
Research on Photoelectric Effect for Artificial Satellite Communication
Sitong Zhang
Green Light Optimal Speed Advisory Systems under Multi-modal Traffic Environments for Reducing Fuel Consumption
Gang Lu, Yuming Ge, Miaqiong Wang, Jian Wang, Da Wei, Chen Kang, Rundong Yu

IoTBDH–2020 TECHNICAL SESSIONS
19 December 2020 Saturday
15:10-17:00 Session IoTBDH: Internet of Things of Big Data for Healthcare (Room-3)
Session Chair: Po Yang, University of Sheffield, UK
Invited talk: Intelligent Task offloading and Service Migration in Edge Computing
Jia Hu, University of Exeter, UK
Interoperable Multi-Modal Data Analysis Platform for Alzheimer's Disease Management
Zhen Pang, Shuhao Zhang, Yun Yang, Jun Qi, Po Yang

Visual Analysis of Biomarkers Selected via Multi-Task Learning for Modeling Alzheimer's Disease Progression
Xulong Wang, Gaoshan Bi, Yu Zhang, Jun Qi, Yan Yang, Po Yang

Investigation of Side-Polished Panda Fibers for Strain Measurement and Surface Plasmon Resonance-Based Biochemical Sensing
Tiesheng Wu, Zhihui Liu, Huixian Zhang, Zuning Yang, Dan Yang, Yiping Wang

A Hybrid Hierarchical Model for Accessing Physical Activity Recognition towards Free-living Environments
Jun Qi, Hai-Ning Liang, Jianjun Chen, Xiyang Peng, Lee Newcombe, Po Yang

Experimental Analysis of Artificial Neural Networks Performance for Accessing Physical Activity Recognition in Daily Life
Xiyang Peng, Xiang Wang, Jun Qi, Yun Yang, Jie Li, Po Yang

Part II: TECHNICAL SESSIONS OF BDCloud-2020

BDCloud-2020 TECHNICAL SESSIONS
18 December 2020 Friday

10:10-12:40  Session BDCloud: Big Data and Cloud Computing (Room-3)
Session Chair: Bipasa Bose, San Jose State University, USA

Continuous Debugging of Microservices
Hong Zhu, Ian Bayley, Hongbo Wang

Cloud - Edge Offloading Model for Vehicular Traffic Analysis
Dragi Kimovski, Dijana C. Bogatinoska, Narges Mehran, Aleksandar Karadimce, Natasha Paunkoska, Radu Prodan, Ninoslav Marina

Blockchain and Homomorphic Encryption for Digital Copyright Protection
Wenyue Sun, Haokun Fang, Shensheng Zheng, Quan Qian

Hemp Disease Detection and Classification Using Machine Learning and Deep Learning
Bipasa Bose, Jyotsna Priya, Sonam Welekar, Zeyu Gao

A Neural Attentive Model Using Human Semantic Knowledge for Clickbait Detection
Feng Wei, Uyen Trang Nguyen

Automatic Road Detection in Traffic Videos
Hadi Ghahremannezhad, Hang Shi, Chengjun Liu

Energy-aware Multimedia Applications Scheduling on VFI-NoC-MPSoc using as an Edge-device in IoT
Umair Ullah Tariq, Haider Ali, John Panneerselvam, James Hardy, Lu Liu

Part III: TECHNICAL SESSIONS OF SocialCom-2020 and Associated Workshops/Symposia

SocialCom-2020 TECHNICAL SESSIONS
18 December 2020 Friday

15:10-17:00  Session SocialCom_1: Social Network Analysis and Applications (Room-3)
Session Chair: Phoey Lee Teh, Sunway University, Malaysia

Identifying the Right Person in Social Networks with Double Metaphone Codes
Joshua D. Hamilton, Carson Leung, Sehaj P. Singh

Matching User Accounts across Large-scale Social Networks based on Locality-sensitive Hashing
Yongjun Li, Xiangyu Li, Jiaqi Yang, Congjie Gao

An Analysis of Twitter Responses to the 2019 Ridgecrest Earthquake Sequence
Tao Ruan, Qingkai Kong, Yawen Zhang, Sara K. McBride, Qin Lv
Music Social Tags Representation in Dimensional Emotion Models
Na He, Sam Ferguson

Identifying Panic Triggers from Disaster-Related Tweets
Nasser Assery, Xiaohong Yuan, Xiuli Qu, Sultan Almalki, Kaushik Roy

17:10-19:00  Session SocialCom_2: Computational Social Systems for Smart City (Room-3)
Session Chair: Carson Leung, University of Manitoba, Canada
Exploring the Usage of Online Food Delivery Data for Intra-Urban Job and Housing Mobility Detection and Characterization
Yawen Zhang, Seth Spielman, Qi Liu, Si Shen, Jason Shuo Zhang, Qin Lv
Practical Strategy of Acquaintance Immunization without Contact Tracing
Zhihao Dong, Yuanzhu Chen, Terrence S. Tricco, Cheng Li, Ting Hu
Analyzing Societal Impact of COVID-19: A Study During the Early Days of the Pandemic
Swaroop Gowdra Shanthakumar, Anand Seetharam, Arti Ramesh
Hyper-Casual Endless Game Based Dynamic Difficulty Adjustment System for Players Replay Ability
Zichu Yang, Bowen Sun
Monitoring the Perception of Covid-19 Vaccine using Topic Models
Swapna S. Gokhale

19 December 2020 Saturday

8:30-10:30  Session SocialCom_3: Human-centered Computing and Systems (Room-3)
Session Chair: Fei Hao, Shaanxi Normal University, China
A Cluster-based Solution to Achieve Fairness in Federated Learning
Fengpan Zhao, Yan Huang, Akshita Maradapu Vera Venkata Sai, Yubao Wu
Low-light Image Enhancement based on Joint Decomposition and Denoising U-Net Network
Jiawei Deng, Guangyao Pang, Li Wan, Zhenming Yu
Adherent Nuclei Edge Detection Based on Caps-Unet
Yuli Chen, Xingwei Li, Haiting Yao, Xue Li, Miao Ma, Zhao Pei, Cheng Lu
Displacement detection method of QR code reference object based on computer vision
Qiuhui Yang, Xiaoyu Ji, Yanyan Liang
A Multi-granularity Targeted Covert Collection Scheme for Internet Data
Yi Meng, Yangyang Li, Yashen Wang, Hao Jin, Chun Wei, Xiaoyan Yin
Resource Allocation Optimization with Guaranteed Security Level for Anti-traceable Access
Bo Jin, Hao Jin, Yashen Wang, Yangyang Li, Xi Luo, Xiaoqing Gong, Xiaoyan Yin

SMMA-2020 TECHNICAL SESSIONS
19 December 2020 Saturday

17:10-19:00  Session SMMA: Social Media Mining and Analysis (Room-3)
Session Chair: Jiaxing Shang, Chongqing University, China
Invited Tak: The effect of multiple interventions to balance healthcare demand for controlling COVID-19 outbreaks
Po Yang, University of Sheffield, UK
Invited Tak: Intelligent Network Transmission for Interactive Media Streaming Services
Xu Zhang, Nanjing University, China
Application of Iteration Function System for Ceramic Tile Design
Zhiming Chen
Geographical distance and news diffusion associating with the sentiment of tweets: Case Study on London Bridge Attack 2017
Phoei Lee Teh, Jin Quan Low, Yain-Whar Si

Design Application of Smart Kitchen for Aging Based on Interactive Behavior Analysis
Yang Wang, Yuechen Ning

Study on Coupled Social Network Public Opinion Communication Based on Improved SEIR
Changbin Jiang, Yaoyuan Zhang, Hu Wang, Yawen Zhou, Yeuqi Zou

DSONAM–2020 TECHNICAL SESSIONS
19 December 2020 Saturday

17:10-19:00 Session DSONAM: Social Network Analysis and Mining (Room-4)
Session Chair: Jiaxing Shang, Chongqing University, China
Invited talk: Concept-cognitive Learning for Social Network Analysis
Fei Hao, Shanxi Normal University, China
Haozhe Wang, University of Exeter, UK
ITDT: An Iterative Decision Tree-based Approach for Telecom Customer Classification
Jiaxing Shang, Ziwei Jin, Yong Feng, Ran Wei, Baohua Qiang, Wu Xie

Stock Trend Prediction using Historical Data and Financial Online News
Yuemei Xu, Weihang Lin, Yiran Hu

Towards Co-Evolution of Random-Walk-Based Embedding and Label Propagation for Node Classification
Ruixuan Zhao, Shenghang Liu, Wei Rao, Hao Xu, Chongning Na, Ruoyu Li

Part IV: TECHNICAL SESSIONS OF SustainCom-2020

SustainCom-2020 TECHNICAL SESSIONS
19 December 2020 Saturday

10:40-12:40 Session SustainCom: Sustainable Computing and Communications (Room-3)
Session Chair: Yulei Wu, University of Exeter, UK
Spatial-Domain Resource Scheduling for Wireless Computing and Energy Provision in Energy Self-Sustainable F-RAN
Jie Hu, Tingyu Shui, Wei Zhang, Fan Wu, Kun Yang

Reconfigurable Blockchains for Dynamic Cluster-based Applications
Khalil Saadat, Ning Wang, Xinpeng Wei, Bin Da, Rahim Tafazolli

An Effective Three-Channel Combination Configuration Method for ZigBee with WiFi Channel Interference
Jianjun Tan, Xianbo Sun, Yong Huang, Jinqiao Yi, Tao Hu, Li Zhu

A New Controller Placement Technique using Colored Petri-Nets Modelling for SDNs
Wael Hosny Fouad Aly

Topic Clustering Using Induced Squared Correlation Thresholding with Dimension Reduction
Ayodeji Ayorinde, John Panneerselvam, Lu Liu, Dejun Miao
Part V: TECHNICAL SESSIONS OF IUCC-2020

IUCC-2020 TECHNICAL SESSIONS
17 December 2020 Thursday

10:40-12:40  Session IUCC-1: Ubiquitous System, Services and Applications (I) (Room-4)
Session Chair: Kostas Kolomvatsos, University of Thessaly, Greece

Deep Learning Algorithms for Secure Robot Face Recognition in Cloud Environments
Chiranjeevi Karri, M.S.R. Naidu

The underlying causal network from global dyadic events: allies and rivals in international relations
Lei Jiang

A simulator for reinforcement learning training in the recommendation field
Guangyao Pang, Xiaoying Zhu, Keda Lu, Zichen Peng, Weitao Deng

Twi Corpus: A Massively Twi-to-Handful Languages Parallel Bible Corpus
Michael Adjeisah, Guohua Liu, Richard Nuetey Nortey, Jinling Song, Khalid Odartey Lamptey, Felix Nana Frimpong

SP-BTM: A Specific Part-of-speech BTM for Service Clustering
Rong Hu, Jianxun Liu, Yiping Wen

A Kernel Density Estimation-Based Variation Sampling for Class Imbalance in Defect Prediction
Yuqing Zhang, Xuefeng Yan, Arif Ali Khan

13:30-16:00  Session IUCC-2: Ubiquitous Computing (Room-4)
Session Chair: Xiaoding Wang, Fujian Normal University, China

Temporal Data Analytics on COVID-19 Data with Ubiquitous Computing
Yubo Chen, Carson K. Leung, Siyuan Shang, Qi Wen

Evaluating Cloud Auto-Scaler Resource Allocation Planning Under High-Performance Computing Workloads
Kester Leochico, Eugene John

Container Scheduling in Blockchain-based Cloud Service Platform
Lei Yu, Philip S. Yu

An Approach to Estimate Power Consumption of a CUDA Kernel
Gargi Alavani, Jineet Desai, Santonu Sarkar

ECOMA: Edge-Cloud Collaborative Framework for Multi-Task Applications
Zhipei Zhang, Wenting Ma, Qingqing Xu, Renjie Tang, Jinlang Wang, Wai Chen

Real-time detection of cloud tenant malicious behavior based on CNN
Hao Chen, Ruizhi Xiao, Shuyuan Jin

Probabilistic Data Allocation in Pervasive Computing Applications
Kostas Kolomvatsos

Porosity prediction based on GS+GA-XGBoost
Zechen Zheng, Shaowei Pan, Haining Luo, Zhi Guo

16:10-18:40  Session IUCC-3: Ubiquitous Media and Signal Processing (Room-4)
Session Chair: Raad Bin Tareaf, University of Potsdam, Germany

The influence of emotion expression on ergonomics in interface design
Mohan Yang, Bowen Sun, Jianming Yang

A Novel Hierarchical Threshold Secret Image Sharing Scheme
Shiyue Qin, Zhenhua Tan, Hong Li

S-Iter: Using text generation to solve entity sparseness in knowledge reasoning
Xingang Wang, Fengpo Ji, Dong Wang

A Context-Aware Variational Auto-Encoder Model for Text Generation
Zhiqiang Ma, Chunyu Wang, Ji Shen, Baoxiang Du

Ontology-Based Modeling and Semantic Query for Mobile Trajectory Data
Peng Shao, Ming Tao, Min Zhou, Tian Wang

Customizing Super-Resolution Framework According to Image Features
Ninghui Yuan, Jingsyu Liu, Qiong Wang, Li Shen

A Film and TV News Digest Generation Method Based on HanLP
Qing Wu, QingSheng Li, JingJing Zhou, XiaoYa Long, YunQing Guan, HongPing Lin

Does Personality Evolve? A Ten-Years Longitudinal Study from Social Media Platforms
Raad Bin Tareaf, Seyed Ali Alhossein, Christoph Meinel

18 December 2020 Friday

15:10-17:00  Session IUCC-4: Ubiquitous System, Services and Applications (II) (Room-4)

Session Chair: Kostas Kolomvatsos, University of Thessaly, Greece

A Real-time CSI-based Passive Intrusion Detection Method
Xingang Wang, Yufei Wang, Dong Wang

Multi-objective Particle Swarm Optimization Guided by Global Diversity and Cross-generation Competition
Jing Zhao, Xiangyu Qu

Contributor Dilemma in Structured Tri-game
Tongda Zhang, Futian Huang, Jun Qian, Xiao Sun, Yueting Chai, Yi Liu

Performance Analysis of Road Intersections Based on Game Theory and Dynamic Level-k Model
Huisheng Wang, Yuejiang Li, H. Vicky Zhao

A Data-Driven Dynamic Stochastic Programming Framework for Ride-Sharing Rebalancing Problem under Demand Uncertainty
Xiaoming Li, Chan Wang, Xiao Huang, Yunin Nie

A Heuristic Region-based Concurrency Bug Testing Approach
Kuo-Cheng Chin, Ren-Song Tsay, Hsin-I Wu

17:10-19:00  Session IUCC-5: Ubiquitous System, Services and Applications (III) (Room-4)

Session Chair: Kostas Kolomvatsos, University of Thessaly, Greece

Multi-dimensional Analysis of Industrial Big Data Based JSON Document
Minbo Li, Juxiong Xu, Le Han

Commodity Search Algorithm based on Ant Colony Algorithm
Zhishuo Liu, Zhuonan Han

Research on Relation Extraction Method Based on Multi-channel Convolution and BiLSTM Model
Tao Sun, Dong Wang

Predicting Sex and Age using Swipe-Gesture Data from a Mobile Device
Storm P. Davis, Alireza Ashayer, Nasseh Tabrizi

A Virtual Teaching Machine System Based on Oracle-bone-script Learning
Linlin Zhao, QingSheng Li, Li Zhang, Zhiqiang Luo, Huahua Jiang, Chunzhu Jiang, Xiangyu Liu

Distracted Driving Behavior Detection and Identification Based on Improved CornerNet-Saccade
Wei Zheng, Qing Qing Zhang, Zhen Hao Ni, Zhan Guo Ye, Yuan Min Hu, Zhong Jie Zhu

19 December 2020 Saturday
8:30-10:30  Session IUCC-6: Future Networks and Communications (I) (Room-4)
Session Chair: Haojun Huang, Huazhong University of Science and Technology, China
A Multi-Threaded Accelerated Drug Combination Pathway Network Implementation
Haolei Ye, Shu Liu, Wei Xiao, Eric McCreath, Xinzhuang Zhang

Dynamic Task Allocation for Robotic Network Cloud Systems
Saeid Alirezazadeh, Luis A. Alexandre

RSFP: Reliable Service Function Placement with the Optimized Resource Consumption in Data Center Networks
Hong Tang, Ao Ku, Wei Liu, Haojun Huang

Network Evaluation and Planning for Large-scale Low Earth Orbit Satellite Constellation Networks
Li Shen, Huanren Zhou, Xiaoting Wang, Wenping Li, Yuanyuan Fan, Shan Wu, Shuaijun Liu

A Novel Strong Cache Consistency Mechanism in ICN Based on Role Division and Lease Model
Shuokang Huang, Shuai Zhu, Kai Lei, Haiyi Lian, Shouyang Wei

An Aggregate Authentication Framework for Unmanned Aerial Vehicle Cluster Network
Jingyi Li, Meng Zhao, Yong Ding, Dennis Y. W. Liu, Yujue Wang, Hai Liang

10:40-12:40  Session IUCC-7: Future Networks and Communications (II) (Room-4)
Session Chair: Hui Lin, Fujian Normal University, China
Heuristically Speeding up Anonymous Dynamic Network Computations
Austin Halper, Dariusz R. Kowalski, Miguel A. Mosteiro

A Quality-Time Model of Heterogeneous Agents Measure for Crowd Intelligence
Zheming Yang, Wen Ji

A Spatio-Temporal Event Model for Unmanned System Swarm
Yukun Yang, Yuan Yao, Gang Yang, Xingshe Zhou

User Identity Linkage across Location-Based Social Networks with Spatio-Temporal Check-in Patterns
Fengxiang Ding, Xiaoqiang Ma, Yang Yang, Chen Wang

Maritime Broadband Communications: Applications, Challenges and an Offshore 5G-virtual MIMO Paradigm
Cunqian Yu, Jingyu Li, Chunfang Zhang, Hang Li, Rongxi He, Bin Lin

An Intelligent Evaluation Method of Application Scenario Complexity Level of Unmanned Swarms
Wenliang Wu, Xingshe Zhou