

CONFERENCE ABSTRACTS

The 3rd International Conference on Big Data Research (ICBDR)

Workshop

European Symposium on Computer and Communications (ESCC)

November 20-22, 2019

École Internationale des Sciences du Traitement de l'Information (EISTI)

(Campus de Cergy), France

Co-sponsored by



Supported by



TABLE OF CONTENTS

Schedule Overview.....	2
Welcome Address.....	4
Organizing Committee	5
Conference Venue.....	7
Key Points.....	9
Conference Chair.....	10
Speakers.....	12
Prof. Christophe Claramunt.....	12
Prof. Adrian Hopgood.....	13
Prof. Gabriele Mencagli.....	14
Dr. Max Hoffmann.....	15
Oral Presentation at a Glance.....	17
Session I: Data Analysis and Data Mining.....	18
Session II: Data Engineering and Data Calculation.....	23
Session III: Machine Learning and Intelligent Computing.....	26
Session IV: Computer Information Technology and Application.....	30
Poster Session.....	34
Listeners.....	41
Lab. Visit.....	43

SCHEDULE OVERVIEW

WEDNESDAY, NOVEMBER 20, 2019 @Building Condorcet at the Hall

10:00am-5:00pm

Pre-Conference Registration



Registration packets will be available for pickup

THURSDAY, NOVEMBER 21, 2019 @Batiment Condorcet, Hall et Amphithéâtre

8:00am-6:00pm

Registration desk open

Opening Remarks

9:00am-9:05am

Prof. Radjesvarane Alexandre, EISTI, France

Keynote Speeches

9:05am-9:45am

Prof. Christophe Claramunt

Shanghai Maritime University, China
& Naval Academy Research Institute, France

Presentation: *Big Data, Spatial Data and Social Networks over the Web*

9:45am-10:25am

Prof. Adrian Hopgood

University of Portsmouth, UK

Presentation: *Practical Artificial Intelligence with Big Data*

10:25am-10:50am

Group Photo & Coffee Break 

Invited Speeches

10:50am-11:20am

Prof. Gabriele Mencagli

University of Pisa, Italy

Presentation: *Efficient Big Data Streaming on Modern Scale-Up Servers*

11:20am-11:50am

Dr. Max Hoffmann

RWTH Aachen University, Germany

Presentation: *Digital Transformation of modern Production through Industrial Big Data*

12:00pm-1:00pm

Lunch @ Novotel Cergy Pontoise



1:00pm-2:30pm

Session I

TOPIC: Data Analysis and Data Mining

Papers: R011, R012, R041, R016, R026, R036

2:30pm-3:45pm

Session II

TOPIC: Data Engineering and Data Calculation

Papers: R015, R024, R039, R04, R033

3:45pm-4:05pm

Coffee Break & Poster



4:05pm-5:20pm

Session III

TOPIC: Machine Learning and Intelligent Computing

Papers: R020, R010, R018, R08, R030

5:20pm-6:50pm

Session IV

TOPIC: Computer Information Technology and Application

Papers: R008-A, R029, R032, R07, R14, R042

7:00pm-9:00pm

Dinner @ Novotel Cergy Pontoise



FRIDAY, NOVEMBER 22, 2019

9:00am-10:30am

Optional Lab. Visit

Research Team on Extracellular Matrix-Cell Relations in Université de Cergy-Pontoise

WELCOME ADDRESS

It gives us immense pleasure to invite you to The 3rd International Conference on Big Data Research (ICBDR) with the workshop European Symposium on Computer and Communications (ESCC) during the period Nov. 20-22, 2019 in EISTI (Campus de Cergy), Paris, France. The conference focuses on the trending, highly popular, but exciting and extremely challenging areas from our keynote speakers of leading scientists and a variety of authors around the world. The outcome of our deliberations will play a crucial role in progress achieved in these areas.

The conference brings together World Class participants and young researchers looking for opportunities for conversations that cross the traditional discipline boundaries and allows them to resolve multidisciplinary challenging problems that only a venue of this nature can offer. It is the clear intent of the conference to offer excellent mentoring opportunities to participants. Through this amazing event we trust that you will be able to share the state-of-the-art developments and the cutting-edge technologies in these broad areas.

Special thanks are extended to our colleagues in program committee for their thorough review of all the submissions, which is vital to the success of the conference, and also to the members in the organizing committee and the volunteers who had dedicated their time and efforts in planning, promoting, organizing and helping the conference. Last but not least, our special thanks go to invited keynote speakers as well as all the authors for contributing their latest researches to the conference.

This conference program is highlighted by four speakers: Prof. Chrsitophe Claramunt, Shanghai Maritime University (China) & Naval Academy Research Institute (France), Prof. Adrian Hopgood, University of Porstmouth, UK, Prof. Gabriele Mencagli, University of Pisa, Italy and Dr. Max Hoffmann, RWTH Aachen University, Germany.

We hope this success can develop into persistent success annually, in which there are presenters from all corners of the globe and all major countries.

We sincerely hope you have an excellent time during ICBDR 2019 in picturesque Paris.

Conference Committee
Paris, France

ORGANIZING COMMITTEE

Conference Chairs

Prof. Radjesvarane Alexandre, EISTI, France
Prof. Jingchang Pan, Shandong University, China

Technical Program Chairs

Prof. Karine Zeitouni, University of Versailles, France
Prof. DAO Minh-Son, National Institute of Information and Communications Technology, Japan

Technical Program Committee Co-Chairs

Prof. Jifu Zhang, Taiyuan University of Science and Technology, China
Prof. Ali Luo, The National Astronomical Observatories of the Chinese Academy of Sciences (NAOC), China

Publicity Chairs

Prof. Iwao Fujino, Tokai University, Japan
Dr. Cyril Ray, Naval Academy Research Institute, France

Local Organizing Chairs

Assoc. Prof. Souhila Arib, EISTI, France
Assoc. Prof. Maria Malek, EISTI, France

Local Organizing Committee

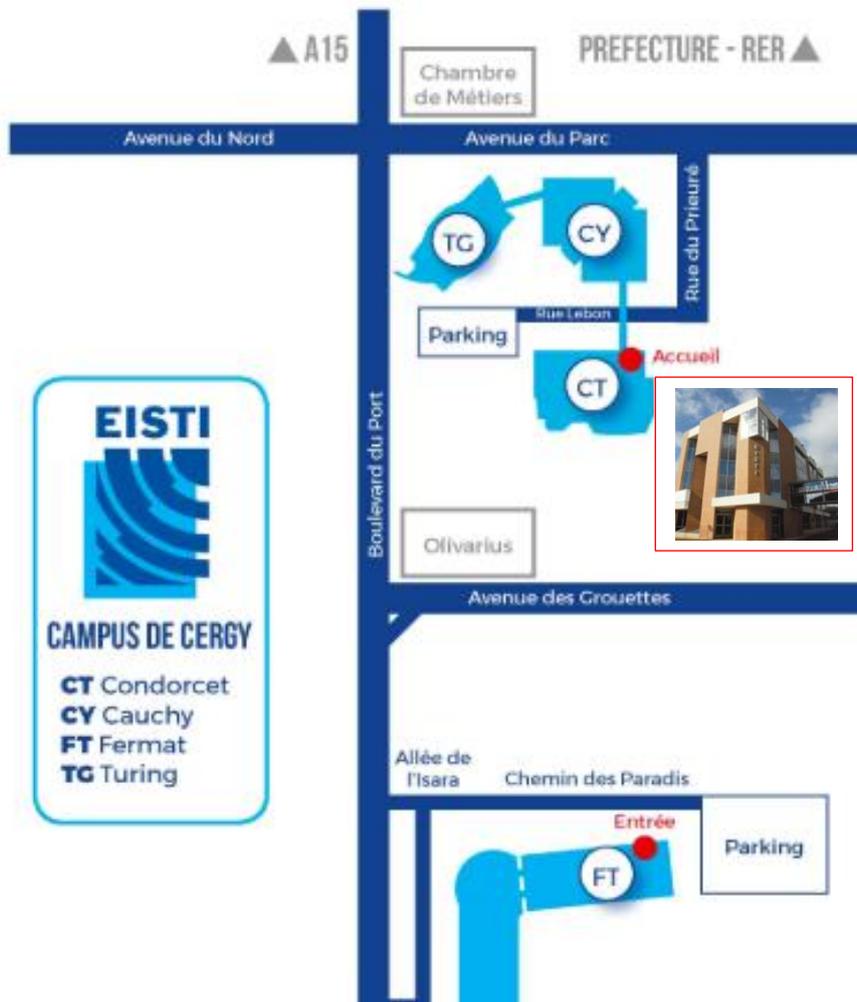
Assoc. Prof. Maria Malek, EISTI, France
Assoc. Prof. Anissa Lamani, EISTI, France
Assoc. Prof. Sonia Yassa, EISTI, France
Assoc. Prof. Tahar Guerbi, EISTI, France
Assoc. Prof. Julien Mercadal, EISTI, France
Assoc. Prof. Bisma Zeddini, EISTI, France

International Technical Committee

Prof. Lars Nolle, Jade University of Applied Science, Germany
Prof. Denio Duarte, Federal University of Fronteira Sul, Brazil
Prof. Wu Huafeng, Shanghai Maritime University, China
Prof. Jiannan Zhang, National Astronomical Observatories of China (NAOC), China
Prof. Bo Qiu, Hebei University of Technology, China
Prof. Haifeng Yang, Taiyuan University of Science and Technology, China
Prof. Takio Kurita, Hiroshima University, Japan
Prof. Reza Malek, KN Toosi University, Iran
Prof. Mahmoud Reza Delavar, University of Teheran, Iran
Prof. Yexid Montenegro, Uniminuto, Colombia

Assoc. Prof. Sergio Ilarri, University of Zaragoza, Spain
Assoc. Prof. David Exposito Singh, Universidad Carlos III De Madrid, Spain
Assoc. Prof. Yude Bu, Shandong University, China
Assoc. Prof. Zhenping Yi, Shandong University, China
Assoc. Prof. Zhongwei Xu, Shandong University, China
Asst. Prof. Alberto Rebassa-Mansergas, Universitat Politecnica de Catalunya, Spain
Dr. Anne-Laurre Joussetme, CMRE, Italy
Dr. Shoko Wakamiya, NAIST, Japan
Dr. Haosheng Huang, University of Zurich, Switzerland
Dr. Aldo Napoli, Ecole des Mines, France
Dr. Carlos Jaime Barrios Hernandez, UNIS, Colombia
Dr. Christos Doukeridis, UPR, Greece
Dr. Weili Zhang, eBay Inc., USA
Dr. Imad Afyouni, University of Sharjah, United Arab Emirates
Dr. Claude Tadonki, Mines ParisTech - CRI, France
Dr. Xin Cao, University of New South Wales, Australia
Dr. Nicolas Turenne, INRA & Université Paris-Est Marne-la-Vallée, France

CONFERENCE VENUE



**Batiment Condorcet, Hall et Amphithéâtre
Main Building of EISTI, (Campus de Cergy), France**

Weather in Cergy

In Cergy-Pontoise, the summers are short, comfortable, and partly cloudy and the winters are long, very cold, windy, and mostly cloudy.

Average daily minimum temperature

37°F

Average daily highest temperature

53°F



How to reach Cergy?

Cergy is served by three stations on Paris RER line A and on the Transilien Paris Saint-Lazare suburban rail line: Cergy – Préfecture, Cergy Saint-Christophe and Cergy Le Haut.

Cergy is served by direct buses from Roissy Charles de Gaulle International Airport. The bus company STIVO provides 17 lines of buses to travel within the agglomeration of Cergy.

Roissy Charle de Gaule airport (47 KM) (Code CDG)

About 1h journey

Bus 95-18 => Cergy Préfecture Stop.

Paris Beauvais Tillé airport (Low cost airport, 69 KM) (Code BVA)

About 1h40 journey

shuttle 15€ => Paris Porte Maillot, then:

=> RER C => Pontoise => bus line Stivo 45, Stop CHEMIN DUPUIS (EISTI) or

=> subway line 1 (M1) => Charles de Gaulle Etoile STOP=> RER A => Cergy Préfecture Stop

Orly airport (60 KM) (Code ORY)

About 1h20 journey

RER C => Pontoise => bus line Stivo 45, Stop CHEMIN DUPUIS (EISTI) or

RER C => Paris Porte Maillot => subway line 1 (M) => Charles de Gaulle Etoile Stop=>

RER A => Cergy Préfecture Stop.



Hotels Close to the Campus

Novotel Cergy Pontoise - 3 Avenue du Parc, 95011 Cergy

Olivarius Apart'hotels Cergy - 34 Boulevard du Port, 95000 Cergy

ibis Cergy-Pontoise Le Port Hotel - 28 Avenue des Grouettes, 95000 Cergy Pontoise

Hôtel F1Cergy - 3 Avenue des 3 Fontaines, 95000 Cergy

KEY POINTS



Oral Presentation

- ◆ Timing: a maximum of 15 minutes in total, including 3 minutes for Q&A. Please make sure your presentation is well timed. Please keep in mind that the program is full and that the speaker after you would like their allocated time available to them.
- ◆ All oral session rooms are equipped with data projectors with a standard VGA connector. The speakers could also bring and use their own laptops or other presentation devices. Please check the compatibility of your laptop and the project before the session starts.
- ◆ In the break before your presentation, please go to the scheduled room and copy the slide file (PPT or PDF) to the laptop.
- ◆ Videos: If your Power Point files contain videos please make sure that they are well formatted and connected to the main files.



Poster Presentation

- ◆ Poster size is 60cm x 80cm.
- ◆ Posters are required to be condensed and attractive.



Dress Code

- ◆ Please wear formal clothes or national characteristics of clothing.



Dos and Don'ts

- ✦ Take care of your belongings during the conference. The conference is NOT responsible for your belongings at all times.
- ✦ Always wear your participation badge during the conference. There'll be no access for people without a badge.
- ✦ Never discard your badge at will. There's a risk of irrelative people who use it for unknown purpose.

CONFERENCE CHAIR



Prof. Radjesvarane Alexandre, EISTI, France

Radjesvarane Alexandre joins EISTI as Academic Director on 1 September 2018. He became the Chief Executive Officer on January 1, 2019, and will succeed Nesim Fintz, current Managing Director and founder of the school.

As academic director, Radjesvarane Alexander is in charge of defining and implementing the school's training and research policy. As such, he has the entire faculty and educational components under his responsibility.

He is following Hervé de Milleville, a professor-researcher at EISTI since 1984 and director of studies since 2008, who is claiming his retirement rights.

Born in 1966, a doctor of applied mathematics and an associate of mathematics, Radjesvarane Alexandre started his career in higher education in 1993 at Paris VII University. From 1996 to 2006, he taught in several engineering schools. He is a lecturer at the University of Orleans from 1994 to 2003, where he obtained the Habilitation to direct research (HDR) in 2000, then from 2004 at the University of Evry, before joining in as Professor of Universities at ENSAM, the Ecole Navale de Brest where he practices from 2007 to 2013. He co-directs the IRENav (Research Institute of the Naval Academy) from 2007 to 2011. As of From 2010 until 2013, he is also Chair Professor of Shanghai Jiao Tong University - Department of Mathematics and Institute of Natural Sciences. His career then remains marked by the international. In 2013, he became Delegate for Education and International Relations of ParisTech before taking the position of Director of Research, Innovation and Technology Transfer, in 2016 at USTH - Vietnam France University in Hanoi, a position he held before he arrived at EISTI.

His research focuses on the mathematical analysis of partial derivative equations, including a part about kinetic equations, in collaboration with Cédric Villani.

Nesim Fintz, from January 1, 2019 will focus on institutional issues and support governance in the conduct of the Paris Seine Initiative project, labeled I-Site Excellence Initiative (Initiatives Science, Innovation, Territories, Economy) of the Investment Program. Future (PIA 2).

CONFERENCE CHAIR



Prof. Jingchang Pan

Shandong University, China

Professor Jingchang Pan is currently the associate dean at School of Mechanical and Electrical Engineering of Shandong University, Weihai, China. His research interests are in Data and Data Mining, Distributed and Parallel Computing, Software Engineering and Applications, Machine Learning and Artificial Intelligence. Prof. Jingchang Pan received his bachelor's degree in Department of Computer Science and Technology, Peking University, Master's degree in Harbin Institute of Technology and Ph.D degree in Shandong University. He is a reviewer of *Spectroscopy and Spectroscopy* , *Chinese Science (Physical Mechanics Astronomy)* , *IEEE Journal of Biomedical and Health Informatics* , *Advances in Astronomy* etc. and a member of the Expert Committee on Information Technology and Informatization of Shandong Institute of Electronics.

KEYNOTE SPEAKER



Prof. Christophe Claramunt

Shanghai Maritime University, China

Naval Academy Research Institute, France

Presentation: Big Data, Spatial Data and Social Networks over the Web

Abstract: Nowadays the Web and other information resources and exchange mediums such as Twitter, Snapchat and many others provide many novel opportunities for the analysis of human interactions and behaviors. This talk will introduce several examples of recent work that consider these information means as big data systems that offer several avenues for social and economic studies. I will first introduce a graph-based and computational modelling approach that derives the main structural, temporal and spatial properties that emerge from the study of an implicit research community exhibited by a series of conferences over the Web. Next I will present a study that explores large crowd behavior at the regional scale using a large geo-tagged Twitter dataset. The main idea behind this computational study is to explore human spatio-temporal patterns and moods at the regional scale in Japan. Patterns are analyzed in space and time, emotions are categorized using a sentiment-based dictionary approach. Finally I will discuss some of the many opportunities left for further research.

Professor Christophe Claramunt is currently the chair of the Naval Academy Research Institute in France. He was previously a senior lecturer in computing at the Nottingham Trent University and senior researcher at the Swiss Federal Institute of Technology in Lausanne. His research is oriented towards theoretical, computational and pluri-disciplinary aspects of geographical information systems. Over the past few years he has been regularly involved in EU funded projects such as the H2020 project datAcron "Big Data Analytics for Time Critical Mobility Forecasting". Amongst other affiliations, he is a research fellow at the Research Center for Social Informatics of the Kwansai University in Japan, Centre for Planning Studies at the Laval University, the Laboratory for Geographical Information Science at the Chinese University of Hong Kong and the Logistics Engineering Department at the Shanghai Maritime University.

KEYNOTE SPEAKER



Prof. Adrian Hopgood

University of Portsmouth, UK

Presentation: *Practical Artificial Intelligence with Big Data*

Abstract: Big data are important for delivering practical artificial intelligence, but they are not the complete picture. A wide range of techniques has emerged from the field of artificial intelligence including rules, frames, model-based reasoning, case-based reasoning, Bayesian updating, fuzzy logic, multiagent systems, swarm intelligence, genetic algorithms, deep learning, and neural networks. They are all ingenious and useful in narrow contexts. It will be argued in this presentation that a truly intelligent system needs to draw on a variety of these approaches within a hybrid system. Five distinct ways to enhance or complement one technique with another will be identified. Several practical examples will be presented, ranging from medical diagnosis to the control of specialised manufacturing processes.

Adrian Hopgood is Full Professor of Intelligent Systems and Director of Future & Emerging Technologies at the University of Portsmouth in the UK. He is also a visiting professor at the Open University and at Sheffield Hallam University. He is a Chartered Engineer, Fellow of the BCS (the Chartered Institute for IT), and a committee member for the BCS Specialist Group on Artificial Intelligence.

Professor Hopgood has extensive experience in both academia and industry. He has worked at the level of Dean and Pro Vice-Chancellor in four universities in the UK and overseas, and has enjoyed scientific roles with Systems Designers (now part of Hewlett-Packard) and the Telstra Research Laboratories in Australia.

His main research interests are in artificial intelligence and its practical applications. He has supervised 19 PhD projects to completion and published more than 100 research articles. His text book "Intelligent Systems for Engineers and Scientists" has been published in three editions and is ranked as a bestseller.

INVITED SPEAKER



Prof. Gabriele Mencagli

University of Pisa, Italy

Presentation: *Efficient Big Data Streaming on Modern Scale-Up Servers*

Abstract: An ever-growing number of devices are capable of sensing the world by producing huge flows (data streams) of information regarding the users and the environment. A large set of applications need efficient processing techniques to extract insights and complex knowledge from such a massive and transient data deluge. Furthermore, to keep the processing in real-time, existing systems must expose parallel features to adapt the algorithms and the way the processing is performed to unpredictable and time-varying input rates and workloads.

This talk will provide a critical review of traditional Stream Processing Systems targeting large-scale distributed platforms (e.g., Apache Flink, Storm and Spark Streaming). Most of them are still inadequate to exploit the computational power provided by modern scale-up servers equipped with several multi-core CPUs and co-processors like GPUs and FPGAs. This talk will clarify the reasons for such inefficiencies, which pave the way to the design of the WindFlow library, a new C++ framework for stream processing on scale-up servers built on top of the RISC-like parallel building blocks provided by the FastFlow parallel programming environment. The talk will show experimental results on some real-world applications and will conclude with a discussion on future research problems and open directions in this research field.

Gabriele Mencagli is an Assistant Professor at the Computer Science Department of the University of Pisa, Italy. He got his PhD in 2012 from the same University. His research is oriented towards novel parallel paradigms for data stream processing, autonomic computing and high-performance computing in general. He has been involved in several Italian and European research projects (i.e. FP7 Repara and H2020 Rephrase projects) and in industrial collaborations (e.g., with AutoDesk CO.). He published more than 50 peer-reviewed papers appeared in international conferences and journals. He is member of the editorial board of Future Generation Computer Systems (Elsevier) and Cluster Computing (Springer).

INVITED SPEAKER



Dr. Max Hoffmann

RWTH Aachen University, Germany

Presentation: *Digital Transformation of modern Production through Industrial Big Data*

Abstract: Modern manufacturing is characterized by high amounts of data. This data is generated by various machines, sensors and further IoT devices. In times of digital transformation, it becomes easier to gather this distributed data. However, by facilitating the gathering of data, the storage and consolidation becomes more difficult. Due to the high heterogeneity of information sources and the high velocity of data implied by the various distributed devices, Big Data arises. In the industrial field, which is characterized by grown infrastructures, the handling of such Big Data can become difficult.

The talk addresses the chances and challenges of Big Data in industrial manufacturing. The speaker will emphasize the need for adaptive and scalable solutions required in a heterogeneous environment of modern factories. For this purpose, various concepts and architectures will be motivated, which are able to tackle the challenges of the brown field, which represents a diverse and grown ecosystem in existing factories. Finally, the Data Lake will be introduced, a modern concept that is built for changing environments and unforeseen events in the manufacturing area. Based on this generic data storage, future-oriented scenarios such as the use of artificial intelligence and the integration of neural networks into the production are made possible.

Dr. Max Hoffmann is a scientific researcher with the Institute of Information Management in Mechanical Engineering at the RWTH Aachen University since 2012. In the years from 2012 to 2017 he focused on the consulting of various industrial partners as part of the research group “Production Technology” as well as on his Ph.D. thesis (Dr.-Ing.). Since 2016, Max Hoffmann is Research Group Leader of the “Industrial Big Data” group, which focuses on the requirement of modern manufacturing with regard to the digitization. Prior to his engagement with the institute Max Hoffmann has studied Mechanical Engineering with emphasis on Process Engineering at the RWTH Aachen University until 2010. Parallel to his first consultancy activities in IT he acquired an additional degree in general economic science in 2012 by achieving a Master of Business Administration (MBA). In the context of his doctorate activities as well as in terms of his current research, Max Hoffmann is focusing on topics related to the digitization in the manufacturing industries. The covers the information

technological process chain from the acquisition of data in the field by making use of semantic interface and IoT technologies (OPC UA, MQTT, ...), the integration of information using highly scalable technologies (Big Data) as well as the creation of valuable insights for the production process by means of data-driven approaches (Machine Learning). A distinctive focus of the Industrial Big Data group hereby consists in the research novel concepts for processing and storage of huge data sets by making use of “Data Lake” approaches. These concepts allow for a holistic usage of data from the field together with information from higher systems of production planning and control (ERP, MES, ...). Current research activities of Max Hoffmann besides topics related to the “Industrial Big Data” also cover fields such as semantic technologies, ontologies and the application of (Industrial) Internet of Things technologies in the production context. Additional research activities focus on multi-agent system technologies in manufacturing. In this context, Max Hoffmann is part of the expert group “Agent systems in automation technology”, member of the technical committee “Agent systems” of the VDI/VDE-Gesellschaft Mess- und Automatisierungstechnik (GMA) as well as author of the standard of the working group.

Oral Presentations at a Glance



Session I: Data Analysis and Data Mining

- R011:** Improvement of Big Data Stream Mining Technique for Automatic Bone Age Assessment
- R012:** A Sub-Linear Scalable MapReduce-based Apriori Algorithm
- R041:** Online Embedding and Clustering of Data Streams
- R016:** Adaptive Normalization in Streaming Data
- R026:** An analysis of Data Science study in the field of Editing and Publishing science in China (2008-2018)
- R036:** Assessing Reliability of Big Data Stream for Smart City



Session II: Data Engineering and Data Calculation

- R015:** Extracting 4-attributes Vessel Courses from AIS Data with Pqk-Means and Topic Model
- R024:** Data Migration - Cloudsim Extension
- R039:** A Multi-sensor Big Data fusion Method in Quality Prediction of the Plasma Enhanced Chemical Vapor Deposition Process
- R04:** Case-based Approach to Detect Emergence Behaviour
- R033:** An Improved Fuzzy Neural Network for Reinforcement Learning



Session III: Machine Learning and Intelligent Computing

- R020:** Big data scalability based on Spark Machine Learning Libraries
- R010:** Performance Analysis of Deep Learning Network Models of Localized Images in Chest X-ray Decision Support System
- R018:** MPCC-Generic Secure Multi-Party Computation in Centralized Cloud-based Environments
- R08:** Platoon-assisted Vehicular Cloud in VANET: Vision and Challenges
- R030:** An Application of Machine Learning Technique in Forecasting Crop Disease



Session IV: Computer Information Technology and Application

- R008-A:** Extracting knowledge from imagery using deep autoencoders
- R029:** Fault-Tolerant Efficient Peer-to-Peer Distributed Random Trees
- R032:** Guidelines for Key Organizational Factors for SaaS Organizations
- R07:** Pressure vessel design simulation using hybrid harmony search algorithm
- R14:** Attitude of University Students towards the Use of Institutional Repositories
- R042:** COMPARISON OF PREDICTIVE MODELS FOR FORECASTING TIME-SERIES DATA

*One best presentation will be selected from each session.