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Guojun Wang · Albert Zomaya
Gregorio Martinez Perez · Kenli Li (Eds.)

Algorithms and Architectures for Parallel Processing

15th International Conference, ICA3PP 2015
Zhangjiajie, China, November 18–20, 2015
Proceedings, Part III

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Editors
Guojun Wang
Central South University
Changsha
China

Albert Zomaya
The University of Sydney
Sydney, NSW
Australia

Gregorio Martinez Perez
University of Murcia
Murcia
Spain

Kenli Li
Hunan University
Changsha
China

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Welcome Message from the ICA3PP 2015 General Chairs

Welcome to the proceedings of the 15th International Conference on Algorithms and Architectures for Parallel Processing (ICA3PP 2015), which was organized by Central South University, Hunan University, National University of Defense Technology, and Jishou University.

It was our great pleasure to organize the ICA3PP 2015 conference in Zhangjiajie, China, during November 18–20, 2015. On behalf of the Organizing Committee of the conference, we would like to express our cordial gratitude to all participants who attended the conference.

ICA3PP 2015 was the 15th event in the series of conferences started in 1995 that is devoted to algorithms and architectures for parallel processing. ICA3PP is now recognized as the main regular event in the world that covers many dimensions of parallel algorithms and architectures, encompassing fundamental theoretical approaches, practical experimental projects, and commercial components and systems. The conference provides a forum for academics and practitioners from around the world to exchange ideas for improving the efficiency, performance, reliability, security, and interoperability of computing systems and applications.

ICA3PP 2015 attracted high-quality research papers highlighting the foundational work that strives to push beyond the limits of existing technologies, including experimental efforts, innovative systems, and investigations that identify weaknesses in existing parallel processing technology.

ICA3PP 2015 consisted of the main conference and six international symposia and workshops. Many individuals contributed to the success of the conference. We would like to express our special appreciation to Prof. Yang Xiang, Prof. Andrzej Goscinski, and Prof. Yi Pan, the Steering Committee chairs, for giving us the opportunity to host this prestigious conference and for their guidance with the conference organization. Special thanks to the program chairs, Prof. Albert Zomaya, Prof. Gregorio Martinez Perez, and Prof. Kenli Li, for their outstanding work on the technical program. Thanks also to the workshop chairs, Dr. Mianxiong Dong, Dr. Ryan K.L. Ko, and Dr. Md. Zakirul Alam Bhuiya, for their excellent work in organizing attractive symposia and workshops. Thanks also to the publicity chairs, Prof. Carlos Becker Westphall, Dr. Yulei Wu, Prof. Christian Callegari, Prof. Kuan-Ching Li, and Prof. James J. (Jong Hyuk) Park, for the great job in publicizing this event. We would like to give our thanks to all the members of the Organizing Committee and Program Committee as well as the external reviewers for their efforts and support. We would also like to give our thanks to the keynote speakers, Prof. John C.S. Lui, Prof. Jiannong Cao, Prof. Wanlei Zhou, and Prof. Hai Jin, for offering insightful and enlightening talks. Last but not least, we would like to thank all the authors who submitted their papers to the conference.

November 2015

Guojun Wang
Peter Mueller
Qingping Zhou

Welcome Message from the ICA3PP 2015 Program Chairs

On behalf of the Program Committee of the 15th International Conference on Algorithms and Architectures for Parallel Processing (ICA3PP 2015), we would like to welcome you to join the conference held in Zhangjiajie, China, during November 18–20, 2015.

The ICA3PP conference aims at bringing together researchers and practitioners from both academia and industry who are working on algorithms and architectures for parallel processing. The conference features keynote speeches, panel discussions, technical presentations, symposiums, and workshops, where the technical presentations from both the research community and industry cover various aspects including fundamental theoretical approaches, practical experimental projects, and commercial components and systems. ICA3PP 2015 was the next event in a series of highly successful international conferences on algorithms and architectures for parallel processing, previously held as ICA3PP 2014 (Dalian, China, August 2014), ICA3PP 2013 (Vietri sul Mare, Italy, December 2013), ICA3PP 2012 (Fukuoka, Japan, September 2012), ICA3PP 2011 (Melbourne, Australia, October 2011), ICA3PP 2010 (Busan, Korea, May 2010), ICA3PP 2009 (Taipei, Taiwan, June 2009), ICA3PP 2008 (Cyprus, June 2008), ICA3PP 2007 (Hangzhou, China, June 2007), ICA3PP 2005 (Melbourne, Australia, October 2005), ICA3PP 2002 (Beijing, China, October 2002), ICA3PP2000 (Hong Kong, China, December 2000), ICA3PP 1997 (Melbourne, Australia, December 1997), ICA3PP 1996 (Singapore, June 1996), and ICA3PP 1995 (Brisbane, Australia, April 1995).

The ICA3PP 2015 conference collected research papers on related research issues from all around the world. This year we received 602 submissions for the main conference. All submissions received at least three reviews during a high-quality review process. According to the review results, 219 papers were selected for oral presentation at the conference, giving an acceptance rate of 36.4 %.

We would like to offer our gratitude to Prof. Yang Xiang and Prof. Andrzej Goscinski from Deakin University, Australia, and Prof. Yi Pan from Georgia State University, USA, the Steering Committee chairs. Our thanks also go to the general chairs, Prof. Guojun Wang from Central South University, China, Dr. Peter Mueller from IBM Zurich Research, Switzerland, and Prof. Qingping Zhou from Jishou University, China, for their great support and good suggestions for a successful the final program. Special thanks to the workshop chairs, Dr. Mianxiong Dong from Muroran Institute of Technology, Japan, and Dr. Ryan K.L. Ko from the University of Waikato, New Zealand, and Dr. Md. Zakirul Alam Bhuiyan from Temple University, USA. In particular, we would like to give our thanks to all researchers and practitioners who submitted their manuscripts, and to the Program Committee and the external reviewers who contributed their valuable time and expertise to provide professional reviews working under a very tight schedule. Moreover, we are very grateful to our keynote speakers who kindly accepted our invitation to give insightful and prospective talks.

Finally, we believe that the conference provided a very good opportunity for participants to learn from each other. We hope you enjoy the conference proceedings.

Albert Zomaya
Gregorio Martinez Perez
Kenli Li

Welcome Message from the ICA3PP 2015 Workshop Chairs

Welcome to the proceedings of the 15th International Conference on Algorithms and Architectures for Parallel Processing (ICA3PP 2015) held in Zhangjiajie, China, during November 18–20, 2015. The program this year consisted of six symposiums/ workshops covering a wide range of research topics on parallel processing technology:

(1) The 6th International Workshop on Trust, Security and Privacy for Big Data (TrustData 2015)
(2) The 5th International Symposium on Trust, Security and Privacy for Emerging Applications (TSP 2015)
(3) The Third International Workshop on Network Optimization and Performance Evaluation (NOPE 2015)
(4) The Second International Symposium on Sensor-Cloud Systems (SCS 2015)
(5) The Second International Workshop on Security and Privacy Protection in Computer and Network Systems (SPPCN 2015)
(6) The First International Symposium on Dependability in Sensor, Cloud, and Big Data Systems and Applications (DependSys 2015)

The aim of these symposiums/workshops is to provide a forum to bring together practitioners and researchers from academia and industry for discussion and presentations on the current research and future directions related to parallel processing technology. The themes and topics of these symposiums/workshops are a valuable complement to the overall scope of ICA3PP 2015 providing additional values and interests. We hope that all of the selected papers will have a good impact on future research in the respective field.

The ICA3PP 2015 workshops collected research papers on the related research issues from all around the world. This year we received 205 submissions for all workshops. All submissions received at least three reviews during a high-quality review process. According to the review results, 77 papers were selected for oral presentation at the conference, giving an acceptance rate of 37.6 %.

We offer our sincere gratitude to the workshop organizers for their hard work in designing the call for papers, assembling the Program Committee, managing the peer-review process for the selection of papers, and planning the workshop program. We are grateful to the workshop Program Committees, external reviewers, session chairs, contributing authors, and attendees. Our special thanks to the Organizing Committees of ICA3PP 2015 for their strong support, and especially to the program chairs, Prof. Albert Zomaya, Prof. Gregorio Martinez Perez, and Prof. Kenli Li, for their guidance.

Finally, we hope that you will find the proceedings interesting and stimulating.

Mianxiong Dong
Ryan K.L. Ko
Md. Zakirul Alam Bhuiyan

Welcome Message from the TrustData 2015 Program Chairs

The 6th International Workshop on Trust, Security and Privacy for Big Data (TrustData 2015) was held in Zhangjiajie, China.

TrustData aims at bringing together people from both academia and industry to present their most recent work related to trust, security, and privacy issues in big data, and to exchange ideas and thoughts in order to identify emerging research topics and define the future of big data.

TrustData 2015 was the next event in a series of highly successful international workshops, previously held as TrustData 2014 (Dalian, China, March 2012) and TrustData 2013 (Zhangjiajie, China, November, 2013).

This international workshop collected research papers on the aforementioned research issues from all around the world. Each paper was reviewed by at least three experts in the field. We feel very proud of the high participation, and although it was difficult to collect the best papers from all the submissions received, we feel we managed to have an amazing conference that was enjoyed by all participants.

We would like to offer our gratitude to the general chairs, Dr. Qin Liu and Dr. Muhammad Bashir Abdullahi, for their excellent support and invaluable suggestions for a successful final program. In particular, we would like to thank all researchers and practitioners who submitted their manuscripts, and the Program Committee members and additional reviewers for their tremendous efforts and timely reviews.

We hope you enjoy the proceedings of TrustData 2015.

Keqin Li
Avinash Srinivasan

Welcome Message from the TSP 2015 Program Chairs

On behalf of the Program Committee of the 5th International Symposium on Trust, Security and Privacy for Emerging Applications (TSP 2015), we would like to welcome you to the proceedings of the event, which was held in Zhangjiajie, China.

The symposium focuses on trust, security, and privacy issues in social networks, cloud computing, Internet of Things (IoT), wireless sensor networks, and other networking environments or system applications; it also provides a forum for presenting and discussing emerging ideas and trends in this highly challenging research area. The aim of this symposium is to provide a leading edge forum to foster interaction between researchers and developers with the trust, security, and privacy issues, and to give attendees an opportunity to network with experts in this area.

Following the success of TSP 2008 in Shanghai, China, during December 17–20, 2008, TSP 2009 in Macau SAR, China, during October 12–14, 2009, TSP 2010 in Bradford, UK, during June 29–July 1, 2010, and TSP 2013 in Zhangjiajie, China, during November 13–15, 2013, the 5th International Symposium on Trust, Security and Privacy for Emerging Applications (TSP 2015) was held in Zhangjiajie, China, during November 18–20, 2015, in conjunction with the 15th International Conference on Algorithms and Architectures for Parallel Processing (ICA3PP 2015).

The symposium collected research papers on the aforementioned research issues from all around the world. Each paper was reviewed by at least two experts in the field. We realized an amazing symposium that we hope was enjoyed by all the participants.

We would like to thank all researchers and practitioners who submitted their manuscripts, and the Program Committee members and additional reviewers for their tremendous efforts and timely reviews.

We hope you enjoy the proceedings of TSP 2015.

Imad Jawhar
Deqing Zou

Welcome Message from the NOPE 2015 Program Chair

Welcome to the proceedings of the 2015 International Workshop on Network Optimization and Performance Evaluation (NOPE 2015) held in Zhangjiajie, China, during November 18–20, 2015.

Network optimization and performance evaluation is a topic that attracts much attention in network/Internet and distributed systems. Due to the recent advances in Internet-based applications as well as WLANs, wireless home networks, wireless sensor networks, wireless mesh networks, and cloud computing, we are witnessing a variety of new technologies. However, these systems and networks are becoming very large and complex, and consuming a great amount of energy at the same time. System optimization and performance evaluation remain to be resolved before these systems become a commodity.

On behalf of the Organizing Committee, we would like to take this opportunity to express our gratitude to all reviewers who worked hard to finish reviews on time. Thanks to the publicity chairs for their efforts and support. Thanks also to all authors for their great support and contribution to the event. We would like to give our special thanks to the Organizing Committee, colleagues, and friends who worked hard behind the scenes. Without their unfailing cooperation, hard work, and dedication, this event would not have been successfully organized.

We are grateful to everyone for participating in NOPE 2015.

Gaocai Wang

Welcome Message from SCS 2015 Program Chairs

As the Program Chairs and on behalf of the Organizing Committee of the Second International Symposium on Sensor-Cloud Systems (SCS 2015), we would like to express our gratitude to all the participants who attended the symposium in Zhangjiajie, China, during November 18–20, 2015. This famous city is the location of China's first forest park (The Zhangjiajie National Forest Park) and a World Natural Heritage site (Wulingyuan Scenic Area).

The aim of SCS is to bring together researchers and practitioners working on sensor-cloud systems to present and discuss emerging ideas and trends in this highly challenging research field. It has attracted some high-quality research papers, which highlight the foundational work that strives to push beyond limits of existing technologies, including experimental efforts, innovative systems, and investigations that identify weaknesses in the existing technology services.

SCS 2015 was sponsored by the National Natural Science Foundation of China, Springer, the School of Information Science and Engineering at Central South University, and the School of Software at Central South University, and it was organized by Central South University, Hunan University, National University of Defense Technology, and Jishou University. SCS 2015 was held in conjunction with the 15th International Conference on Algorithms and Architectures for Parallel Processing (ICA3PP 2015), which highlights the latest research trends in various aspects of computer science and technology.

Many individuals contributed to the success of this international symposium. We would like to express our special appreciation to the general chairs of main conference, Prof. Guojun Wang, Prof. Peter Mueller, and Prof. Qingping Zhou, for giving us this opportunity to hold this symposium and for their guidance in the organization. Thanks also to the general chairs of this symposium, Prof. Jie Li and Prof. Dongqing Xie, for their excellent work in organizing the symposium. We would like to give our thanks to all the members of the Organizing Committee and Program Committee for their efforts and support.

Finally, we are grateful to the authors for submitting their fine work to SCS 2015 and all the participants for their attendance.

Xiaofei Xing
Md. Zakirul Alam Bhuiyan

Welcome Message from the SPPCN 2015 Program Chairs

On behalf of the Program Committee of the Second International Workshop on Security and Privacy Protection in Computer and Network Systems (SPPCN 2015), we would like to welcome you to join the proceedings of the workshop, which was held in Zhangjiajie, China.

The workshop focuses on security and privacy protection in computer and network systems, such as authentication, access control, availability, integrity, privacy, confidentiality, dependability, and sustainability issues of computer and network systems. The aim of the workshop is to provide a leading-edge forum to foster interaction between researchers and developers working on security and privacy protection in computer and network systems, and to give attendees an opportunity to network with experts in this area.

SPPCN 2015 was the next event in a series of highly successful international conferences on security and privacy protection in computer and network systems, previously held as SPPCN 2014 (Dalian, China, December 2014). The workshop collected research papers on the above research issues from all around the world. Each paper was reviewed by at least two experts in the field.

We would like to offer our gratitude to the general chair, Prof. Jian Weng, for his excellent support and contribution to the success of the final program. In particular, we would like to thank all researchers and practitioners who submitted their manuscripts, and the Program Committee members and additional reviewers for their tremendous efforts and timely reviews.

We hope all of you enjoy the proceedings of SPPCN 2015.

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Mianxiong Dong
Hua Guo
Tieming Cheng
Kaimin Wei

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Welcome Message from the DependSys 2015 Program Chairs

As the program chairs and on behalf of the Organizing Committee of the First International Symposium on Dependability in Sensor, Cloud, and Big Data Systems and Applications (DependSys2015), we would like to express our gratitude to all the participants attending the international symposium in Zhangjiajie, China, during November 18–20, 2015. This famous city is the location of China's first forest park (The Zhangjiajie National Forest Park) and a World Natural Heritage site (Wulingyuan Scenic Area).

DependSys is a timely event that brings together new ideas, techniques, and solutions for dependability and its issues in sensor, cloud, and big data systems and applications. As we are deep into the Information Age, we are witnessing the explosive growth of data available on the Internet. Human beings are producing quintillion bytes of data every day, which come from sensors, individual archives, social networks, Internet of Things, enterprises, and the Internet in all scales and formats. One of the most challenging issues we face is to achieve the designed system performance to an expected level, i.e., how to effectively provide dependability in sensor, cloud, and big data systems. These systems need to typically run continuously, which often tend to become inert, brittle, and vulnerable after a while.

This international symposium collected research papers on the aforementioned research issues from all around the world. Although it was the first event of DependSys, we received a large number of submissions in response to the call for papers. Each paper was reviewed by at least three experts in the field. After detailed discussions among the program chairs and general chairs, a set of quality papers was finally accepted. We are very proud of the high number of participations, and it was difficult to collect the best papers from all the submissions.

Many individuals contributed to the success of this high-caliber international symposium. We would like to express our special appreciation to the steering chairs, Prof. Jie Wu and Prof. Guojun Wang, for giving us the opportunity to hold this symposium and for their guidance in the symposium organization. In particular, we would like to give our thanks to the symposium chairs, Prof. Mohammed Atiquzzaman, Prof. Sheikh Iqbal Ahamed, and Dr. Md Zakirul Alam Bhuiyan, for their excellent support and invaluable suggestions for a successful final program. Thanks to all the Program Committee members and the additional reviewers for their tremendous efforts and timely reviews.

We hope you enjoy the proceedings of DependSys 2015.

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Latifur Khan
Joarder Kamruzzaman
Al-Sakib Khan Pathan

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Organization

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