



PROGRAM GUIDE

CSE 2018

21st IEEE International Conference on Computational Science and Engineering

29-31 October 2018

*Faculty of Automatic Control and Computers, University Politehnica of
Bucharest, Romania*



Table of Contents

<i>CSE-2018 Organizing Committee</i>	3
<i>Welcome Message from CSE-2018 General Co-Chairs.....</i>	4
<i>CSE and EUC 2018 Keynotes</i>	6
<i>CSE-2018 Conference Program.....</i>	9
<i>Time Table</i>	15

CSE-2018 Organizing Committee

General Chairs

Florin Pop, University Politehnica of Bucharest; National Institute for Research and Development in Informatics, Romania

Horacio Gonzalez-Velez, National College of Ireland, Dublin, Ireland

Jacek Rak, Gdansk University of Technology, Poland

Program Chairs

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Ewa Niewiadomska-Szynkiewicz, Warsaw University of Technology, Poland

David Hutchison, Lancaster University, United Kingdom

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Kuan-Ching Li, Providence University, Taiwan

Peter Sloot, Universiteit van Amsterdam, Netherlands

Laurence T. Yang, St. Francis Xavier University, Canada (Chair)

International Liaison Committee

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Aniello Castiglione, University of Salerno, Italy

Francesco Palmieri, University of Salerno, Italy

Hai Jin, Huazhong University of Science and Technology, China

Kim-Kwang Raymond Choo, The University of Texas at San Antonio, USA

Maarten van Steen, University of Twente, Netherlands

Man Ho Allen Au, The Hong Kong Polytechnic University, China

Welcome Message from CSE-2018 General Co-Chairs

We would like to welcome you to CSE 2018, the 21st IEEE International Conference on Computational Science and Engineering, which will be held at University Politehnica of Bucharest, Romania, between 29 and 31 October 2018, the year that marks 100 years since the formation of the modern Romanian state. CSE 2018 is organized in conjunction with the 16th IEEE International Conference on Embedded and Ubiquitous Computing (EUC 2018).

The Computational Science and Engineering area has earned prominence through advances in electronic and integrated technologies beginning in the 1940s. Current times are very exciting and the years to come will witness a proliferation in the use of various advanced computing systems. It is increasingly becoming an emerging and promising discipline in shaping future research and development activities in academia and industry, ranging from engineering, science, finance, economics, arts and humanitarian fields, especially when the solution of large and complex problems must cope with tight timing schedules.

In this edition we emphasize in particular the relation between Big Data platforms, datacenters, modelling and simulation and resilient communications in the presence of disaster-based disruptions of all types for existing and future communication network architectures. As such, we welcome the participation of the cHiPSet and RECODIS COST Actions. In addition, the edition is organised together with the H2020 Data4Water and PNIII ROBIN projects. Modelling and Simulation (MS) offer suitable abstractions to manage the complexity of analyzing different systems in various scientific and engineering domains. For example, the simulation of large systems in the case of faults can offer a better understanding of systems modelling with high performance capabilities.

Smart solutions based on different data (collected from satellites, in-situ observations, from wireless sensor networks, etc.) can be applied in different domains: natural disasters, and environmental monitoring (e.g. water resource management), human centric solutions (e.g. smart habitats for older adults, enhanced living environments), Cloud-based solutions for robots' interactions (social robots, assistive robots, intelligent cars, etc.), complex Big Data applications in science, engineering, medicine, healthcare, finance, business, law, education, transportation, retailing, telecommunication. Effective solutions require appropriate ICT algorithms, architectures and platforms, having in view the advance of science in this area and the development of new and innovative connected solutions (particularly in the area of Cloud and mobile systems). The CSE conference aims, as such, to provide a platform for the dissemination of recent research efforts that explicitly aim at addressing these challenges and supports the presentation of advanced solutions in these areas.

This edition of CSE has 28 accepted papers from all over the world (with less than 50% acceptance ratio). Each submission was peer-reviewed by program committee members or invited external reviewers. This edition we have 4 invited talks and 6 sessions for the main track.

Organizing this international conference for many years is a collective effort. We are honored to thank all of the members of the organization committee and program committee, as well as

all of the reviewers, for their hard work in finalizing the reviews on time, and the authors for submitting their papers. We would like to give our special thanks to Prof. Laurence T. Yang and Prof. Kuan-Ching Li the Honorary Chairs for their guidance on organizing the conference. We would like to thank program co-chairs for their excellent work. We would like to express our great appreciation to our keynote speakers for accepting our invitation as keynote speakers of CSE and EUC.

This wonderful community of researchers contributes to the success of this event. We also express our gratitude and thank to all members of local organizing committee for their valuable contribution to this successful event. The editors would like to thanks to Lisa O'Conner (IEEE CPS Production Editor) for the editorial assistance and excellent cooperative collaboration to produce this valuable scientific work. We appreciate the support offered by EasyChair system team to handle the paper submission, review process and communications with authors and reviewers. We thank them for this important support.

We hope you will enjoy the conference together with us and have a great time in Bucharest and in Romania.

CSE-2018 General Co-Chairs

Florin Pop, *University Politehnica of Bucharest; National Institute for Research and Development in Informatics, Romania*

Horacio Gonzalez-Velez, *National College of Ireland, Dublin, Ireland*

Jacek Rak, *Gdansk University of Technology, Poland*

CSE and EUC 2018 Keynotes

Invited talk: Social Robots in Support of Elderly People

Adina Magda Florea – *Professor of Artificial Intelligence and Dean of Faculty of Automatic Control and Computers, University Politehnica of Bucharest, Romania*

Abstract: Social robots are becoming more frequent nowadays. They can be of help and support for enhancing living conditions of elderly or people with special needs. The presentation covers such robots and a particular application in which the Pepper robot supports elderly, developed in the framework of a European project.



Bio: Adina Magda Florea is professor of Artificial Intelligence at the Department of Computer Science, University POLITEHNICA of Bucharest. She is the coordinator of the Laboratory for Artificial Intelligence and Multi-Agent Systems (AI-MAS). She is Senior member of IEEE and ACM and President of the Romanian Association of Artificial Intelligence (ARIA).

Invited talk: The next generation of Cyber-Physical Systems

Ioan Dumitrache - *Professor of Automatic Control Engineering at Department of Automatic Control and Systems Engineering University Politehnica of Bucharest, Romania*

Abstract: Cyber Physical Systems are physical, biological and engineered systems whose operations are monitored, coordinated, controlled and integrated by computing and communication core. CPSs represent a new technological revolution, they are more than Networking and Information Technology, the Information and Knowledge in action are integrated on physical objects: they are manifested from the nano-world to large-scale wide-area systems of systems and at multiple time-scales. New generation of CPSs promise to transform our world with systems that respond more quickly, are more precise, work in dangerous or inaccessible environments, provide large-scale distributed coordination, and are highly efficient.



Bio: Ioan Dumitrache is member of the Romanian Academy. He graduated from the Polytechnic University of Bucharest in 1962 and obtained the title of Doctor in Automatic Engineering in 1970. He completed his studies through specialization programs conducted in the U.S. (1969, 1971, 1991, 1994), in Germany, France, and so on. He has held several senior positions within the university, including: Dean (1984-1990) Dean of Automation and Computer Science (1976-1984), Head of Automation and Systems Engineering (1996-2012) and Rector of the Polytechnic University of Bucharest (2000-2004). The main areas of research are: Algorithms and Advanced Leadership Strategies, Intelligent Leading Systems with applications in Biotechnology, Complex

Integrated Systems (Cyber-Physical Systems). He is the author of over 40 books and monographs, covering areas such as intelligent robot management, numerical process management, process optimization, and more, and more than 270 scientific papers published in journals and scientific journals and volumes of specialized International Conferences. He is the editor of over 24 volumes published in national and international publishing houses in automated and information technology.

Invited talk: Beyond Fast and Furious: Smart approaches to data-intensive parallel programming

Horacio González-Vélez - *cHiPSet IC1406 COST ACTION Vice-Chair & Founding Head of The Cloud Competency Centre National College of Ireland*

Abstract: Large data-intensive multiprocessing systems have long posed a challenge to known distributed systems programming techniques as a result of the inherent heterogeneity and dynamism of their resources. This talk presents some ideas on how to exploit the structure and behaviour of data-intensive parallel applications to efficiently allocate dispersed computational resources taking into account non-functional requirements. By abstracting commonly-used patterns of parallel computation, communication, and interaction, programmers can arguably enable parallel applications with substantial data requirements to adapt to the most suitable



computing resources. We shall also discuss some lessons learned from the work in cHiPSet, a major European COST Action on High-Performance Modelling and Simulation for Big Data Applications <http://chipset-cost.eu/>.

Bio: As associate professor and founding head of the Cloud Competency Centre at the National College of Ireland in Dublin, Horacio González-Vélez directs the NCI's cloud and data analytics infrastructure, postgraduate programmes, and research with a clear emphasis on innovation, education inclusion, and industrial partnerships. He started his career working for innovation-driven companies such as Silicon Graphics and Sun Microsystems. Horacio currently carries out applied research in parallel and distributed computing funded by a number of public and industrial organisations. He has been recognised with the European Commission ICT award for his efforts on scientific dissemination and the UK NESTA Crucible Fellowship for his inter-disciplinary research on computational science. He is the vice-chair cHiPSet and holds a PhD in Informatics from the University of Edinburgh. Additional details on his career can be gathered from his LinkedIn profile at: <http://linkedin.com/in/horaciogv/>.

Invited talk: Technology in our not-so-distant ageing future

Rafael Maestre Ferriz - *Head of Electronics Department, Technical Research Centre of Furniture and Wood of the Region of Murcia CETEM, Spain*

Abstract: Europe and most western countries are standing in the path of a coming tidal wave of exponentially growing assistance costs due mainly to an ageing society. Technology is becoming an invaluable tool as part of a long-term solution. This keynote will provide an overview of existing solutions, what they have accomplished, but also what still needs to be addressed.



Bio: Dr. Rafael Maestre Ferriz is the Head of the Embedded Systems Department at CETEM. He holds a PhD from the Complutense University of Madrid under the doctoral program of Information and Computer Systems. He has an extensive international experience as a Project Manager and lead researcher in various R&D positions in both academia, and US industry, including one start-up (Morpho Technologies) and a world-class leading company (Qualcomm). In recent years, he has been the coordinator and main researcher of many EU-level and national projects funded with competitive R&D project grants, as well as company-funded ones. Dr. Maestre has been teaching ICT-related subjects at different universities for over a decade, while being a prolific inventor (8 patents currently in force). His non-confidential research has been published in prestigious international journals (one of which was recognized with a best paper award), several book chapters, and many international conference papers.

Invited talk: COST Action CA16226 – “Indoor living space improvement: Smart Habitat for the Elderly”

Francisco Jose Melero - *Technical Research Centre of Furniture and Wood of the Region of Murcia CETEM, Spain*

Abstract: SHELD-ON aims to foster knowledge exchange and the development of a joint research agenda in terms of design and development of multifunctional indoor environments to meet the requirements of Europe’s ageing population while promoting healthy and safe ageing. We shall also discuss some lessons learned from the work in SHELD-ON, a major European COST Action on Indoor living space improvement: Smart Habitat for the Elderly. <http://www.sheld-on.eu/>.



Bio: Dr. Francisco Melero represents R&D International Projects en CETEM – Technical Research Centre of Furniture and Wood. He is the Coordinator of the COST Action CA16226, SHELD-ON, focusing on smart habitats for older adults.

CSE-2018 Conference Program

Monday, 29 October 2018

08:00 Registration

09:00-09:30 Opening Ceremony

09:30-10:30 Single Session: EUC-2018 & CSE-2018 Keynote I

Prof. Adina-Magda Florea, University Politehnica of Bucharest, Romania

Title: Social Robots in Support of Elderly People

10:30-11:00 Coffee Break

11:00-12:30 Parallel Sessions

CSE-S1: Distributed Computing-1

1.	<p>DC Energy Data Measurement and Analysis for Productivity and Waste Energy Assessment <i>Marta Chinnici, Ah-Lian Kor, Anastasiia Grishina, Eric Rondeau, Jean Philippe Georges, Davide De Chiara and Guido Guarnieri</i></p>
2.	<p>Analysis and Design of Doors, in the Context of Consistency, Availability, Partitioning and Latency <i>Dorin Mihai Palanciuc Mawas</i></p>
3.	<p>ASCOOP: Actors in Scala With Cooperative Scheduling <i>Vlad Nicolae Serbanescu, Frank De Boer and Mohammad Mahdi Jaghoori</i></p>
4.	<p>Data Consistency in Mobile Collaborative Networks Based on the Drop Computing Paradigm <i>Vladut-Constantin Tabusca, Radu-Ioan Ciobanu and Ciprian Dobre</i></p>

12:30 - 14:00 Lunch Break**14:00-15:00 Single Session: EUC-2018 & CSE-2018 Keynote II**

Dr. Horacio González-Vélez, Cloud Competency Centre National College of
Ireland, Ireland

*Title: Beyond Fast and Furious: Smart approaches to data-intensive parallel
programming*

15:00-15:30 Coffee Break**15:30-17:30 Parallel Sessions****CSE-S2: Distributed Computing-2**

1.	Exploring the Performance Envelope of the LLL Algorithm <i>Michael Burger, Christian Bischof, Alexandru Calotoiu, Thomas Wunderer and Felix Wolf</i>
2.	A Time-triggered Scheduling Algorithm for Active Diagnosis in Heterogeneous Distributed Systems <i>Sarah Amin and Roman Obermaisser</i>
3.	Efficient Visualisation of Large-scale Metal Melt Flow Simulations Using Lossy in-situ Tabular Encoding for Query-driven Analytics <i>Henry Lehmann, Eric Werzner, Cornelius Demuth, Subhashis Ray and Bernhard Jung</i>
4.	BaseHub Platform for Monitoring IoT Devices <i>Maria-Luiza Şerban and Dan Ştefan Tudose</i>
5.	A Performance Analysis of GNSS Positioning Data <i>Jamal Raiyn</i>

Tuesday, 30 October 2018

08:00 Registration

09:00-10:30 Single Session: EUC-2018 & CSE-2018 Keynote III

Dr. Rafael Maestre Ferriz, Head of Electronics Department, Technical Research Centre of Furniture and Wood of the Region of Murcia CETEM, Spain

Title: Technology in our not-so-distant ageing future

Mr. Francisco Melero, SHELD-ON CA16226 COST ACTION Chair & Technical Research Centre of Furniture and Wood of the Region of Murcia CETEM, Spain

Title: Indoor living space improvement: Smart Habitat for the Elderly

10:30-11:00 Coffee Break

11:00-12:30 Parallel Sessions

CSE-S3: Dependable, Reliable and Autonomic Computing

1.	Two SDN Multi-tree Approaches for Constrained Seamless Multicast <i>Constant Colombo, Francis Lepage, René Kopp and Eric Gnaedinger</i>
2.	Parallel Computation of Band Depth <i>Ming Ouyang, Hanfei Xu and Alexander Zhurkevich</i>
3.	Short-term Traffic Flow Forecasting Using a Distributed Spatial-temporal K Nearest Neighbors Model <i>Anton Agafonov and Alexander Yumaganov</i>
4.	Network-centric Co-simulation Framework for Software-in-the-loop Testing of Geographically Distributed Simulation Components

	<i>Tobias Pieper and Roman Obermaisser</i>
5.	An Empirical Study on Teleworking Among Slovakia's Office-based Academics <i>Michal Beno</i>

12:30 - 14:00 Lunch Break**14:00-15:00 Single Session: EUC-2018 & CSE-2018 Keynote IV**

Prof. Ciprian Dobre, University Politehnica of Bucharest

Title: Integrated and validated evidence-based Internet of Things (IoT)

15:00-15:30 Coffee Break**15:30-17:30 Parallel Sessions****CSE-S4: Big Data**

1.	A Dataset for Software Requirements Risk Prediction <i>Zain Shaukat, Rashid Naseem and Muhammad Zubair</i>
2.	An Overview of Image Engineering in Recent Years <i>Yu-Jin Zhang</i>
3.	Optimized GPU Implementation of Jpeg 2000 for Satellite Image Decompression <i>Derviş Utku Ufuk, Alptekin Temizel and Ahmet Murat Özbayoğlu</i>
4.	HSTREAM: a Directive-based Language Extension for Heterogeneous Stream Computing <i>Suejb Memeti and Sabri Pllana</i>
5.	Finding Maximum Edge Biclique in Bipartite Networks by Integer Programming <i>Melih Sözdinler and Can Özturan</i>

19:00-21:00 Banquet Party

Restaurant Hanu Berarilor "Casa Oprea Soare"

<https://hanuberarilor.ro/en/contact>

Wednesday, 31 October 2018

08:00 Registration

09:00-10:30 Single Session: EUC-2018 & CSE-2018 Keynote V

Prof. Ioan Dumitrache, University Politehnica of Bucharest, Romania

Title: The next generation of Cyber-Physical Systems

10:30-11:00 Coffee Break

11:00-12:30 Parallel Sessions

CSE-S5: Applications

1.	A Critical Analyze on Healthcare Monitoring Systems Requirements <i>Mohammed Tali, Nirvana Popescu and Sarmad Monadel</i>
2.	A Hybrid 2D and 3D Convolution Neural Network for Stereo Matching <i>Xuan Zeng, Yewen Li, Ziqian Chen and Liping Zhu</i>
3.	Gene Selection Based on Fuzzy Measure with L1 Regularization <i>Jinfeng Wang, Jiajie Chen and Hui Wang</i>
4.	Smart Shopping Technologies for Indoor Markets <i>George Suciu, Adrian Pasat, Maria-Cristina Dițu and Ioana Rogojanu</i>

12:30 - 14:00 Lunch Break

14:00-16:00 Parallel Sessions

CSE-S6: Security, Privacy and Trust

1.	Securing Networks Using SDN and Machine Learning <i><u>Dragos Comaneci</u>, Ciprian Dobre</i>
2.	Blockchain Privacy-preserving in Intelligent Transportation Systems <i><u>Liviu - Adrian Hirtan</u> and Ciprian Dobre</i>
3.	Parallelizing the Hybrid Lattice-reduction and Meet-in-the-middle Attack <i>Thomas Wunderer, <u>Michael Burger</u> and Giang Nam Nguyen</i>
4.	Abnormal Bus Data Detection of Intelligent and Connected Vehicle Based on Neural Network Yangyang Liu, Changqing Dong, Yanan Zhang, <u>Peiji Shi</u> , Xuebin Shao and Chao Ma
5.	Test and Evaluation System for Automotive Cybersecurity <i><u>Peiji Shi</u>, Changqing Dong, Yanan Zhang, Yangyang Liu, Xuebin Shao and Chao Ma</i>

16:00-16:30 Closing Ceremony

Time Table

EUC-2018 and CSE-2018 Session Schedule

October 29th - 31st, 2018

Central Library of the University Politehnica of Bucharest, 2nd Floor,
University Politehnica of Bucharest, Romania

Monday (Oct. 29, 2018)		Room 1 (2.1)	Room 2 (2.2)
Slot	Time	Registration	
Opening	09:00 - 09:30	Opening Ceremony	
Session 1	09:30 - 10:30	EUC-2018 and CSE-2018 Keynote I	
Coffee Break	10:30 - 11:00	Coffee Break	
Session 2	11:00 - 12:30	CSE-S1	EUC-S1
Lunch	12:30 - 14:00	Lunch Break	
Session 3	14:00 - 15:00	EUC-2018 and CSE-2018 Keynote II	
Coffee Break	15:00 - 15:30	Coffee Break	
Session 4	15:30 - 17:30	CSE-S2	EUC-S2

Tuesday (Oct. 30, 2018)		Room 1 (2.1)	Room 2 (2.2)
Slot	Time	Registration	
Session 1	09:00 - 10:30	EUC-2018 and CSE-2018 Keynote III	
Coffee Break	10:30 - 11:00	Coffee Break	
Session 2	11:00 - 12:30	EUC-S3	CSE-S3
Lunch	12:30 - 14:00	Lunch Break	
Session 3	14:00 - 15:00	EUC-2018 and CSE-2018 Keynote IV	
Coffee Break	15:00 - 15:30	Coffee Break	
Session 4	15:30 - 17:30	EUC-S4	CSE-S4
Social Event	19:00 - 21:00	Banquet Party	

Wednesday (Oct. 31, 2018)		Room 1 (2.1)	Room 2 (2.2)
Slot	Time	Registration	
Session 1	09:00 - 10:30	EUC-2018 and CSE-2018 Keynote V	
Coffee Break	10:30 - 11:00	Coffee Break	
Session 2	11:00 - 12:30	CSE-S5	EUC-S5
Lunch	12:30 - 14:00	Lunch Break	
Session 3	14:00 - 16:00	CSE-S6	EUC-S6
Closing event	16:00 - 16:30	Closing Ceremony	