

IEEE CITS 2015

**2015 International Conference on
Computer, Information and Telecommunication Systems**

July 15-17, 2015, Gijón, Spain

Technical Sponsors:



CITS 2015 is sponsored by the Gijón Polytechnic School of Engineering and the Department of Informatics of the University of Oviedo, and the Gijón Convention Bureau



CITS 2015 General Chair's Message

Welcome to the 2015 International Conference on Computer, Information and Telecommunication Systems (CITS 2015). This year's conference marks the fourth CITS, which is being held on annual basis.

CITS 2015 offers a unique forum for researchers and practitioners from academia, industry, business, and government to share their expertise results and research findings in all areas of Computer, Information and Telecommunication Systems.

This year's conference includes an outstanding technical program, distinguished keynote speakers, and an insightful tutorial. We have chosen the campus of the University of Oviedo-Gijon as the CITS 2015 venue. The site provides excellent meeting facilities and will be a comfortable setting for our conference.

The CITS 2015 technical program consists of several parallel tracks and will last for three days. The topics covered in the program include, wireless networks, wireless sensor networks, computer networks and telecommunications, admission control in networking, parallel and distributed computing, databases and data mining, hardware/architecture/real-time systems, MIMO systems, modeling and simulation, performance evaluation, digital signal processing, image processing, pattern recognition, multimedia systems and video processing, character and pattern recognition, artificial intelligence, neural networks, fuzzy logic, genetic algorithms, learning automata, cloud computing, web systems, security and information assurance, cryptography, algorithms, biometrics, e-services and e-business, and collaborative learning systems.

This year, we received a large number of high quality papers. Only high quality papers have been accepted. The acceptance ratio is about 40%. This is indicative of the diligent work of the technical program committee chairs, track chairs, technical program committee members and reviewers. The accepted papers come from all over the World with representation from academia, industry, business and government.

Many individuals have contributed to the success of this high caliber international conference. Our sincere appreciation goes to all authors including those whose papers were not included in the program. Many thanks are also due to our distinguished keynote speakers and tutorial instructors for their valuable contribution to the conference.

Special thanks are also due to the senior program chair, Prof. Petros Nicopolitidis, for leading the technical program efforts.

Many thanks to Prof. Kuei-Fang (Leila) Hsiao, the Registration Chair, who has performed several tasks in addition to registration matters.

Special thanks to the local arrangement committee members Professors Daniel F. Garcia (Chair), Francisco J. Suarez, Joaquin Entrialgo, Juan C. Granda, and Pelayo Nuño for their good efforts.

Thanks also are due to the program co-chairs, Professors Kasim Al-Aubidy, Igor Bisio, and Achilles Kameas. Thanks to Francisco J. Suarez, for serving as the Registration Co-Chair.

Many thanks also go to the technical program committee members and reviewers for their timely work and efforts.

Special thanks go to the publication chair, Prof. Daniel Cascado Caballero, for his outstanding work and dedication. Thanks to our dedicated Webmaster Antonio Bueno.

Special thanks go to the international publicity committee members especially, Prof. Der-Jiunn Deng, Essia Hamouda, and Lei Shu.

We would like to also thank other members of the organizing committee, including the tutorials, the special sessions, and the workshops chairs as well as the various international liaisons. Special thanks are due to the international steering committee of the CITS.

We would like to thank the IEEE Communication Society, SCS and FTRA for their technical co-sponsorship of the conference.

Special thanks go to the administrators, faculty and students of the University of Oviedo for hosting the conference and their efforts to have a successful conference.

Finally, on behalf of the 2015 IEEE International Conference on Computer, Information and Telecommunication Systems (CITS 2015), The Society for Modeling and Simulation International (SCS), and the Future Technology Research Association (FTRA), we invite all of you to join us in Gijon, Spain, at CITS 2015. Enjoy the program and your stay in the beautiful City of Gijon, Spain.

Mohammad S. Obaidat and Daniel F. Garcia
General Chairs, CITS 2015 General Chairs

Petros Nicopolitidis
Senior Program Chair, CITS 2015

- **Prof. Mohammad S. Obaidat**, General Co-chair of IEEE CITS 2015, Fellow of IEEE, Fellow of SCS, Past President of the Society for Modeling & Simulation International (SCS), Professor of Computer Science and Software Engineering, Monmouth University, NJ, USA.
- **Professor Daniel F. Garcia**, General Co-chair of IEEE CITS 2015, University of Oviedo, Spain.
- **Professor Petros Nicopolitidis**, Senior Program Chair of IEEE CITS 2015, Department of Informatics, Aristotle University, Greece



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Program At a Glance

Wednesday, July 15		Thursday, July 16		Friday, July 17	
8:30 - 9:00	Registration	8:30 - 9:00	Registration	8:30 - 9:00	Registration
9:00 - 9:15	Opening Session	9:00 - 10:00	Keynote Speech 2	9:00 - 10:15	Tutorial
9:15 - 10:15	Keynote Speech 1	10:00 - 10:15	Break		
10:15 - 10:45	Break	10:15 - 11:45	Networks and Distributed Systems	10.15-10.45	Break
10:45 - 12:15	Computer Networks and Systems I	11:45 - 13:00	Lunch	10.45-12.00	Tutorial (contd)
12:15 - 13:30	Lunch	13:00 - 14:30	Network and Telecommunication Systems	12.00-12.15	Closing Session
13:30 - 15:00	Computer Networks and Systems II	14:30 - 15:00	Break		
15:00 - 15:30	Break	15:00 - 17:15	Computer Systems and Software Learning Systems and System Security		
15:30 - 17:00	Computer Networks and Systems III	20:00	Banquette		

CITS 2015 Banquette will be on *Restaurante Bellavista*

Avda José García Bernardo, 256
33203 Gijón
<http://bellavista-gijon.com/>

Schedule

Wednesday, July 15

08:30 - 09:30

Registration

09:00 - 09:15

Opening Session

9:15 - 10:15

Keynote Speech 1

Networks robustness under multiple failures: relevant metrics analysis and robustness surfaces

Session Chair: Prof. José Luis Sevillano (University of Seville, Spain)

Distinguished Keynote Speaker: Professor José Luis Marzo



Department of Computer Architecture and Technology
University of Girona, Spain

Network science has significantly advanced in the last decade, providing insights into the underlying structure and dynamics of networks. Critical infrastructures, such as telecommunication networks, are omnipresent and play a pivotal role in ensuring the smooth functioning of modern day living. These networks have to constantly deal with failures of their components.

Several strategies to mitigate the effects of single failures have been proposed in the literature. However, multiple failure scenarios are more difficult to manage. The concept of robustness is used to quantify how good is a network under those large-scale failure scenarios.

During the talk, a survey of the current challenges that might lead to multiple failure scenarios of present day networks will be provided. Secondly, a review novel metrics able to quantify the network robustness will be presented. Finally, a unifying framework able to embrace all the proposed metrics will be introduced. These metric values are joined to form the “robustness surface”, which allows the visual assessment of network robustness variability. Results show that a network presents different robustness surfaces (i.e., dissimilar shapes) depending on the failure scenario and the set of metrics.

Short Bio:

Jose L Marzo is full Professor at the Computer Architecture and Technology Department at the University of Girona, Spain. He was at the engineering and development departments with Telefonica before joining academia in 1991. His research interests are in the fields of communication networks, complex networks control and management, and adaptive hypermedia systems. He leads de Broadband Communications and Distributed Systems. He coordinated the participation of his research group to some national Spanish and EU research projects.

Jose L Marzo is also adjunct Professor at the Department of Electrical and Computer Engineering, Kansas State University, USA. There he is member of the Sunflower Networking research group. Jose L Marzo has participated to the technical program committees and chairing sessions of several conferences, including SPECTS, IEEE Globecom, ICC and Infocom. He has co-authored several papers published in international journals and presented in leading international conferences.

10:15 – 10:45

Break

10:45 - 12:15

Computer Networks and Systems I

Session Chairs: Prof. Michel Kadoch (ETS University of Quebec, Canada), Mr. Konstantinos Chatzikokolakis (University of Athens, Greece)

New Challenge: Moving Network based on mmWave Technology for 5G era
Antonio Mastrosimone and Daniela Panno (University of Catania, Italy)

Design and Deployment of a Smart System for Data Gathering in Estuaries Using Wireless Sensor Networks

Lorena Parra (Universidad Politécnica de Valencia, Spain); Efstathios Karampelas (University of the Aegean, Greece); Sandra Sendra (Universidad Politécnica de Valencia, Spain); Jaime Lloret (Universidad Politecnica de Valencia, Spain); Joel J. P. C. Rodrigues (Instituto de Telecomunicações, University of Beira Interior, Portugal)

A New Scheme for Proactive Out of Band Signaling Solution for IP Traceback in Wireless Mesh Network

Mouna Gassara and Faouzi Zarai (Sfax University, Tunisia); Ikbel Daly (Higher Institute of Electronic and Communication of Sfax, Tunisia); Mohammad S. Obaidat (Monmouth University, USA); Kuei-Fang Hsiao (Ming Chuan University, Taiwan)

System based on inertial sensors for behavioral monitoring of wildlife

Alejandro Linares-Barranco, Angel Jimenez-Fernandez and Ricardo Tapiador (University of Seville, Spain); Antonio Rios-Navarro and Juan Dominguez-Morales (University of Seville, Spain)

12:15 - 13:30

Lunch

13:30 - 15:00

Computer Networks and Systems II

Session Chairs: Dr. Kouji Hirata (Kansai University, Japan), Mrs. Hind Castel (Institut Telecom-Telecom SudParis, France)

Multihoming Admission and Mobility Management in Wireless Mesh Network

Fawaz Khasawneh (Ecole de Technologie Supérieure (ETS) - University of Quebec, Canada); Abderrahmane BenMimoune (University of Quebec - ETS, Canada); Kadoch Michel (ETS University of Quebec, Canada); Ahmad Alomari (Université du Québec, Canada); Mohammad Al-Khrayshah (Alberta Energy, Canada)

Sum-Rate Maximizing Cell Association via Dual-Connectivity

Minho Kim, Sang Yeob Jung and Seong-Lyun Kim (Yonsei University, Korea)

Analysis of the Effects of the Hidden Node Problem in IEEE 802.15.7 Uplink Performance

Carlos Ley-Bosch and Itziar G. Alonso-González (University of Las Palmas de Gran Canaria, Spain); David Sánchez-Rodríguez (University of Las Palmas de Gran Canaria & IDeTIC, Networks and Telematic Services, Spain); Miguel Quintana-Suárez (University of Las Palmas de Gran Canaria, Spain)

Design of all-optical networks considering power consumption and four-wave mixing
Kouji Hirata (Kansai University, Japan); Yutaka Fukuchi and Masahiro Muraguchi (Tokyo University of Science, Japan)

15:00 - 15:30

Break

15:30 - 17:00

Computer Networks and Systems III

Session Chairs: Prof. Zan Li (Xidian University, P.R. China), Dr. Zhibo Pang, (ABB AB Corporate Research, Sweden)

Adaptive Secondary-User Selection Without Prior Information for Cooperative Spectrum Sensing in CRNs

Fuhui Zhou and Zan Li (Xidian University, P.R. China); JiangBo Si (Xi'dian, P.R. China); Benjian Hao and Peihan Qi (Xidian University, P.R. China)

A Robust Spectrum Sensing Scheme Based on Multiple Antennas for Cognitive Radios

Danyang Wang (XiDian University, P.R. China); Zan Li and Peihan Qi (Xidian University, P.R. China)

Spectrum sharing: A coordination framework enabled by fuzzy logic

Konstantinos Chatzikokolakis (University of Athens, Greece); Panagiotis Spapis and Alexandros Kaloxylos (Huawei Technologies Duesseldorf GmbH, Greece); George Beinas and Nancy Alonistioti (University of Athens, Greece)

Adaptive virtual machine assignment for multi-tenant data center networks

Suzuki Takaya and Tomotaka Kimura (Tokyo University of Science, Japan); Kouji Hirata (Kansai University, Japan); Masahiro Muraguchi (Tokyo University of Science, Japan)

THURSDAY, JULY 16

8:30 - 9:00

Registration

9:00 - 10:00

Keynote Speech 2

Reliability engineering at Google

Session Chair: Prof. Daniel Garcia (University of Oviedo, Spain)

Distinguished Keynote Speaker: Mr. Ramón Medrano Llamas
Site Reliability Engineer. Google



Building a useful application is part of the challenge. Scaling it up to size at Google is the other part, and it's where SRE (Site Reliability Engineering) is coming into the picture. This talk gives an overview on the technologies and software design patterns that SREs use to make sure that Google's applications run fast and reliable at full scale.

Short Bio:

Ramón Medrano Llamas is a site reliability engineer at Google. He concentrates on the reliability aspects of new Google products and new features of existing products, ensuring that they meet the same high bar as every other Google service. Before joining Google in 2013, he worked at CERN developing and designing distributed systems for physics. He holds a master's degree in computer science.

10:00 - 10:15

Break

10:15 - 11:45

Network and Distributed Systems

Session Chairs: Prof. Helen Karatza (Aristotle University of Thessaloniki, Greece), Dr. Francisco J. Suarez (University of Oviedo, Spain)

Job Scheduling in a Grid Cluster

Kyriaki Skenteridou and Helen Karatza (Aristotle University of Thessaloniki, Greece)

Scheduling Bags of Tasks and Gangs in a Distributed System

Zafeirios Papazachos and Helen Karatza (Aristotle University of Thessaloniki, Greece)

The threshold based queueing system with hysteresis for performance analysis of clouds

Farah Aït Salaht (Telecom SudParis, France); Hind Castel (Institut Telecom-Telecom SudParis, France)

Overlay Network based on WebRTC for Interactive Multimedia Communications

Juan C Granda, Pelayo Huergo, Francisco Suárez and Daniel F Garcia (University of Oviedo, Spain)

11:45 - 13:00

Lunch

13:00 - 14:30

Network and Telecommunication Systems

Session Chairs: Dr. Juan Luis Carús (CTIC, Spain), Dr. Juan C. Granda (University of Oviedo, Spain)

An LTE reconfigurable SOVA/log-MAP turbo decoder for uncorrelated Rayleigh fading

Costas Chaikalis (Technological Educational Institute of Thessaly, Greece); Charalampos Liolios (University of Thessaly, Greece); Vasileios Vlachos (Technological Educational Institute of Thessaly, Greece)

Channel Estimation for Recovery of UHF RFID Tag Collision on Physical Layer

Hanjun Duan, Haifeng Wu and Yu Zeng (Yunnan University of Nationalities, P.R. China)

Introducing Call Admission Control Policies in Handoff Algorithms' Modeling for Radio-over-Fiber Networks at 60 GHz

Evangelos Kosmatos, Nikolaos D. Tselikas and Anthony Boucouvalas (University of Peloponnese, Greece); Kostas Tsagkaris (WINGS ICT Solutions, Greece); Sofia Kapellaki (ICBNet Lab, National Technical University of Athens, Greece); Nikos Pleros (Aristotle University of Thessaloniki, Greece)

Enhanced Router Bypass Using Fine Granularity Transport Channels

Fahad Ghonaim, Thomas E Darcie and Sudhakar Ganti (University of Victoria, Canada)

14:30 - 15:00

Break

15:00 - 17:15

Computer Systems and Software

Session Chairs: Prof. Maria Hallo (National Polytechnic School, Ecuador), Mr. Satish Kumar Sadasivam (IBM India Pvt Ltd, India)

Unobtrusive Health Monitoring System Using Video-Based Physiological Information and Activity Measurements

Alberto Fernandez and Juan Luis Carús (CTIC, Spain); Ruben Usamentiaga, Eduardo Alvarez and Ruben Casado (University of Oviedo, Spain)

Publishing a Scorecard for Evaluating the Use of Open-Access Journals Using Linked Data Technologies

Maria Hallo (National Polytechnic School, Ecuador); Sergio Lujan-Mora and Alejandro Maté (University of Alicante, Spain)

Fast 3D Symmetric Pattern Indexing for Modeling, Tracking and Detection of Semantic Objects

Chin-Yi Cheng and Shyi-Chyi Cheng (National Taiwan Ocean University, Taiwan); Kuei-Fang Hsiao and Jau-Bi Lin (Ming Chuan University, Taiwan)

Comparative Performance Study of SPEC INT 2006 benchmarks on Nehalem, Sandybridge and Haswell Microarchitectures

Satish Kumar Sadasivam (IBM India Pvt Ltd, India); S Thamarai Selvi (Anna University, India)

RESTful Information Exchange among Engineering Tools for Wireless Sensor Networks in Home Automation

Zhibo Pang (ABB AB Corporate Research, Sweden); Jia Wang (Royal Institute of Technology, Sweden); Gargi Bag (ABB, Sweden); Morgan Johansson (ABB Corporate Research, Sweden)

Software Tool for Detection and Filling of Voids as a Part of Tool-Path Strategy Development for Droplet Generating 3D Printers

Jelena Prša (Technical University of Munich, Germany); Javier Sobreviela (Technical University Munich, Germany); Franz Irlinger and Tim C Lueth (Technische Universität München, Germany)

15:00 - 17:15

Learning Systems and Systems Security

Session Chairs: Mr. Javier Salmerón-García (University of Seville, Spain), Dr. Samad Kolahi (Unitec Institute of Technology, New Zealand)

A Novel Parametric Discrete Chaos-based Switching System for Image Encryption

Mohamed Azzaz and Tarek Hadjem (EMP, Algeria); Camel Tanougast (University of Lorraine, France)

Pseudo-Random Sequence Generator Based on Random Selection of an Elliptic Curve

Mustapha Benssalah and Mustapha Djeddou (Ecole Militaire Polytechnique, Algeria); Karim Drouiche (Université de Cergy Pontoise, France)

Learning Automaton based Context Oriented Middleware Architecture for Precision Agriculture

P. Venkata Krishna (VIT University, India); Sudip Misra (Indian Institute of Technology-Kharagpur, India); S Sivanesan (VIT University, India); Mohammad S. Obaidat (Monmouth University, USA)

Adaptive Learning for Efficient Driving in Urban Public Transport

Laura Pozueco, Alejandro García Tuero, Xabiel García Pañeda, David Melendi and Roberto García (University of Oviedo, Spain); Alejandro García Pañeda and Abel Rionda (ADN Mobile Solutions, Spain); Gabriel Díaz (Universidad Nacional de Educación a Distancia - UNED, Spain); María Mitre (University of Oviedo, Spain)

Analysis of UDP DDoS Cyber Flood Attack and Defense Mechanisms on Webserver with Windows Sever 2012 and Linux Ubuntu 13

Kiattikul Treseangrat and Samad Salehi Kolahi (Unitec Institute of Technology, New Zealand); Bahman A. Sarrafpour (Unitec Institute of Technology & Broadpak Corporation, New Zealand)

An ID-based Quadratic-Exponentiation Randomized Cryptographic Scheme

Chandrashekhar Meshram (RTM Nagpur University, Nagpur, India); Mohammad S. Obaidat (Monmouth University, USA)

18.30

Complimentary Tour

20:00

Banquette

FRIDAY, JULY 17

8:30 - 9:00

Registration

9:00 - 10:15

Tutorial

Cloud Computing for Computation Offloading: Application to Robotics

Session Chair: Joaquin Entrialgo (University of Oviedo, Spain)



Javier Salmerón-García received his BsC in Computer Engineering (2011) and MSc in Computer Engineering and Networks (2012) from the University of Seville. He also received an MSc in Software Engineering for Technical Computing from Cranfield University (UK, 2011). He is now doing a PhD focused on Cloud Robotics in the University of Seville. Moreover, he works as a part-time lecturer at the same University. Contact him at jsalmeron2@us.es.



Fernando Díaz-del-Río received his Master in Physics (Electronics) and his Ph.D. from the University of Seville (Spain) in 1997, and currently is an Associate Professor at this University. Mobile robot navigation, bioinspired systems and distributed computing systems are his main research topics. He has participated in more than 20 research projects and contracts. Contact him at fdiaz@us.es



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The use of Cloud Computing for computation offloading has become a field of interest today. In this tutorial we first discuss the main advantages of Cloud computing over computing on local devices. We will see that moving certain applications to the Cloud yields extraordinary results whereas offloading others is not recommendable at all. A simple model will be presented that allows to estimate whether a given application is well suited or not for computation in the cloud.

Then, cloud offloading in the robotics area will be considered. A near to real-time use case will be presented: cloud-based navigation assistance. Experimental results with a prototype running over a ROS(Robot Operating System)-based mobile robot will be presented which includes a dynamically scalable 3D Point Cloud Extractor. For this application case, several offloading models are analyzed, taking into account the inherent computation-communication trade-off. This trade-off will be demonstrated with several performance figures. Moreover, in order to prove the efficacy of the Cloud as an offloading platform, a demonstration video will be shown.

Finally, other higher-level use cases that are extremely useful for Robotics will be considered. For example, a Cloud-based shared world model that can be used by robots for innumerable tasks, like navigation or manipulation. This is not without some challenges like conflicts between robots or the adaptation of the platform to a robot's needs. Therefore, in this case the cloud is used not only for offloading computation, but also for knowledge sharing.

10:15 – 10:45

Break

10:45 – 12:00

Tutorial (contd.)

12:00 – 12:15

Closing Session

