Foreword

It gives us great pleasure to introduce this collection of papers to be presented at the 2015 International Conference on Image Processing, Computer Vision, and Pattern Recognition (IPCV'15), July 27-30, 2015, at Monte Carlo Resort, Las Vegas, USA.

An important mission of the World Congress in Computer Science, Computer Engineering, and Applied Computing (a federated congress to which this conference is affiliated with) includes "Providing a unique platform for a diverse community of constituents composed of scholars, researchers, developers, educators, and practitioners. The Congress makes concerted effort to reach out to participants affiliated with diverse entities (such as: universities, institutions, corporations, government agencies, and research centers/labs) from all over the world. The congress also attempts to connect participants from institutions that have teaching as their main mission with those who are affiliated with institutions that have research as their main mission. The congress uses a quota system to achieve its institution and geography diversity objectives." By any definition of diversity, this congress is among the most diverse scientific meeting in USA. We are proud to report that this federated congress has authors and participants from 78 different nations representing variety of personal and scientific experiences that arise from differences in culture and values. As can be seen (see below), the program committee of this conference as well as the program committee of all other tracks of the federated congress are as diverse as its authors and participants.

The program committee would like to thank all those who submitted papers for consideration. About 56% of the submissions were from outside the United States. Each submitted paper was peer-reviewed by two experts in the field for originality, significance, clarity, impact, and soundness. In cases of contradictory recommendations, a member of the conference program committee was charged to make the final decision; often, this involved seeking help from additional referees. In addition, papers whose authors included a member of the conference program committee were evaluated using the double-blinded review process. One exception to the above evaluation process was for papers that were submitted directly to chairs/organizers of pre-approved sessions/workshops; in these cases, the chairs/organizers were responsible for the evaluation of such submissions. The overall paper acceptance rate for regular papers was 25%; 18% of the remaining papers were accepted as poster papers (at the time of this writing, we had not yet received the acceptance rate for a few individual tracks.)

We are very grateful to the many colleagues who offered their services in organizing the conference. In particular, we would like to thank the members of the Program Committee of IPCV'15, members of the congress Steering Committee, and members of the committees of federated congress tracks that have topics within the scope of IPCV. Many individuals listed below, will be requested after the conference to provide their expertise and services for selecting papers for publication (extended versions) in journal special issues as well as for publication in a set of research books (to be prepared for publishers including: Springer, Elsevier, BMC journals, and others).

- **Prof. Abbas M. Al-Bakry** (Congress Steering Committee); University President, University of IT and Communications, Baghdad, Iraq
- **Prof. Nizar Al-Holou** (Congress Steering Committee); Professor and Chair, Electrical and Computer Engineering Department; Vice Chair, IEEE/SEM-Computer Chapter; University of Detroit Mercy, Detroit, Michigan, USA
- **Dr. Hamid Ali Abed Alasadi** (Congress Steering Committee); Head, Department of Computer Science, Basra University, Iraq; Member of Optical Society of America (OSA), USA; Member of The International Society for Optical Engineering (SPIE), Bellingham, Washington, USA
- **Prof. Christine Amaldas** (BIOCOMP'15); Ritsumeikan Asia Pacific University, Kyoto, Japan
- **Prof. Hamid R. Arabnia** (Congress Steering Committee & Coordinator); Professor of Computer Science; The University of Georgia, USA; Editor-in-Chief, Journal of Supercomputing (Springer); Editor-in-Chief, Emerging Trends in Computer Science and Applied Computing (Elsevier); Editor-in-Chief, Transactions of Computational Science & Computational Intelligence (Springer); Elected Fellow, Int'l Society of Intelligent Biological Medicine (ISIBM); USA
- **Dr. Azita Bahrami** (EEE'15 Session Chair); President, IT Consult, USA
• Prof. Hans-Peter Bischof (MSV'15); Chair/Director, Computer Science MS Program and Graduate Program Coordinator, Department of Computer Science, Rochester Institute of Technology, New York, USA
• Prof. Juan Jose Martinez Castillo; Director, The Acantelys Alan Turing Nikola Tesla Research Group and GIPEB, Universidad Nacional Abierta, Venezuela
• Dr. Bo-Wei Chen (ABDA'15); Department of Electrical Engineering, Princeton University, Princeton, New Jersey, USA; and Interim Chair, IEEE Signal Processing Chapter, Harbin Section.
• Dr. Guangchun Cheng; Google, Inc, Mountain View, California, USA
• Dr. Ravi Chitlala; Elekta Inc, Sunnyvale, California, USA; and University of California Santa Cruz Extension, San Jose, California, USA
• Prof. Kevin Daimi (Congress Steering Committee); Director, Computer Science and Software Engineering Programs, Department of Mathematics, Computer Science and Software Engineering, University of Detroit Mercy, Detroit, Michigan, USA
• Prof. Leonidas Deligiannidis (IPC’15 Session Chair & Co-Editor); Department of Computer Information Systems, Wentworth Institute of Technology, Boston, Massachusetts, USA
• Asst. Prof. J. Deny; IEDC Coordinator, Kalasalingam University, Srivilliputtur, India
• Dr. Lamia Atma Djoudi (Chair, Doctoral Colloquium & Demos Organizer); Synchrone Technologies, France
• Prof. Mary Mehrnoosh Eshaghian-Wilner (Congress Steering Committee); Professor of Engineering Practice, University of Southern California, California, USA; Adjunct Professor, Electrical Engineering, University of California Los Angeles, Los Angeles (UCLA), California, USA
• Prof. George A. Gravvanis (Congress Steering Committee); Director, Physics Laboratory & Head of Advanced Scientific Computing, Applied Math & Applications Research Group; Professor of Applied Mathematics and Numerical Computing and Department of ECE, School of Engineering, Democritus University of Thrace, Xanthi, Greece; former President of the Technical Commission on Data Processing, Social Security for the Migrant Workers, European Commission, Hellenic Presidency, Greece
• Prof. Ray Hashemi (IKE’15 Session Chair); Professor of Computer Science and Information Technology, Armstrong Atlantic State University, Savannah, Georgia, USA
• Prof. Houcine Hassan; Universitat Politècnica de València, Spain
• Prof. Mohammad Shahadat Hossain (PhD, UMIST, Manchester), MBCS; Department of Computer Science and Engineering, University of Chittagong, Bangladesh; Visiting Academic Staff, The University of Manchester, UK
• Dr. M. A. Jabbar; IEEE Computer Society India Council EXECOM Member; Aurora's Engineering College, Bhongir, Telangana, India
• Prof. George Jandieri (Congress Steering Committee); Georgian Technical University, Tbilisi, Georgia; Chief Scientist, The Institute of Cybernetics, Georgian Academy of Science, Georgia; Editorial Board Member: International Journal of Microwaves and Optical Technology, The Open Atmospheric Science Journal, American Journal of Remote Sensing
• Dr. Abdeljalil Khelassi (IKE’15); Associate Professor and Head of Knowledge and Information Engineering Research Team, Computer Science Department, University of Tlemcen, Algeria
• Prof. Byung-Gyu Kim (Congress Steering Committee); Multimedia Processing Communications Lab (MPCL), Department of Computer Science and Engineering, College of Engineering, SunMoon University, South Korea
• Prof. Tai-hoon Kim; School of Information and Computing Science, University of Tasmania, Australia
• Dr. Cardik Kohari (HIMS’15); Biomedical Informatics Center, Harvard Medical School, Boston, Massachusetts, USA
• Assoc. Prof. Dr. Guoming Lai; Computer Science and Technology, Sun Yat-Sen University, Guangzhou, P. R. China
• Dr. Pawan Lingras (IPC’15 Session Chair); Department of Mathematics and Computing Science, St. Mary's University, Canada
• Dr. Bo Liu (ABDA'15 + ICOMP'15); Spatio-temporal Data Analysis Research Department, NEC Labs China, Beijing, P. R. China (formerly at Argonne National Laboratory, USA)
• Dr. Yan Luo (MSV’15); National Institutes of Health, Bethesda, Maryland, USA
• Prof. George Markowsky (Congress Steering Committee); Professor & Associate Director, School of Computing and Information Science; Chair International Advisory Board of IEEE IDAACS; Director 2013 Northeast Collegiate Cyber Defense Competition; President Phi Beta Kappa Delta Chapter of Maine; Cooperating Prof. Mathematics & Statistics Department UMaine; Cooperating Prof. School of Policy & Int'l Affairs UMaine; University of Maine, Orono, Maine, USA
• Dr. Andrew Marsh (Congress Steering Committee); CEO, HoIP Telecom Ltd (Healthcare over Internet Protocol), UK; Secretary General of World Academy of BioMedical Sciences and Technologies (WABT) a UNESCO NGO, The United Nations
We would like to extend our appreciation to the members of the program committees of individual sessions, tracks, and workshops; their names do not appear in this document; they are listed on the web sites of individual tracks.

As Sponsors-at-large, partners, and/or organizers each of the followings (separated by semicolons) provided help for at least one track of the World Congress: Computer Science Research, Education, and Applications Press (CSREA); US Chapter of World Academy of Science (http://www.world-academy-of-science.org/); American Council on Science & Education & Federated Research Council (http://www.americancse.org/); HoIP, Health Without Boundaries, Healthcare over Internet Protocol, UK (http://www.hoip.eu); HoIP Telecom, UK (http://www.hoip-telecom.co.uk); and WABT, Human Health Medicine, UNESCO NGOs, Paris, France (http://www.thewabt.com/). In addition, a number of university faculty members and their staff (names appear on the cover of the set of proceedings), several publishers of computer science and computer engineering books and journals, chapters and/or task forces of computer science associations/organizations from 4 countries, and developers of high-performance machines and
systems provided significant help in organizing the conference as well as providing some resources. We are grateful to them all.

We express our gratitude to keynote, invited, and individual conference/tracks and tutorial speakers - the list of speakers appears on the conference web site. We would also like to thank the followings: UCMSS (Universal Conference Management Systems & Support, California, USA) for managing all aspects of the conference; Dr. Tim Field of APC for managing the printing of the proceedings; and the staff of Monte Carlo Resort (Convention department) in Las Vegas for the professional service they provided. Last but not least, we would like to thank the Co-Editors and Associate Co-Editors of IPCV’15: Prof. Hamid R. Arabnia, Prof. Leonidas Deligiannidis, Prof. George Jandieri, Dr. Gerald Schaefer, Ashu M. G. Solo, and Prof. Fernando G. Tinetti.

We present the proceedings of IPCV’15.

*Steering Committee, 2015*