

ROSE 2014

OCTOBER 16-18, 2014 | TIMISOARA, ROMANIA

2014 IEEE International Symposium on RObotic and SENSors Environments



PROCEEDINGS

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MESSAGE**

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Message from the Chairpersons

On behalf of the organizing, technical and local committees, it is our pleasure to welcome you to the 2014 IEEE International Symposium on Robotic and Sensors Environments, ROSE 2014, being held at the Politehnica University of Timisoara, Romania, on October 16-17, 2014.

The IEEE ROSE Symposium is sponsored by the Institute of Electrical and Electronic Engineers (IEEE) Instrumentation and Measurement Society (IMS). It is organized in collaboration with the IMS' TC-15 Virtual Systems in Measurements, TC-22 Intelligent Measurement Systems, TC-27 Human-Computer Interface and Interaction, TC-28 Instrumentation for Robotics and Automation, and TC-30 Security and Contraband Detection technical committees.

ROSE focuses on sensing systems and technologies for robotics and industrial automation, as well as their impact on autonomous robotics and intelligent systems development and applications. Over the two days of the symposium, the authors have the opportunity to present their work orally, exchange valuable ideas and initiate productive collaborations with colleagues and experts attending this event from all around the world.

Timișoara is the largest city in western Romania and has a long and rich history as an important commercial, industrial and multi-cultural center. It was the first city in Europe and the second in the world to use electrical street lighting in 1884, and the city which started the Revolution of December 1989, to restore the democratic values in Romania. In the last decades, Timișoara has grown to become one of the nation's main poles of high-tech industry, including IT and software development, automotive, telecommunications and multimedia. As a local focus, ROSE 2014 will feature a set of invited talks on current topics in manufacturing robotic and sensor components, integrated circuits design, and related end to end specialized services.

Since its introduction in 2003, ROSE took place in Canada, USA and in several European countries, as a truly international event. Celebrating its 12th edition this year, ROSE 2014 is hosted by Politehnica University of Timisoara, Romania, and its Department of Computer and Software Engineering. Politehnica University of Timisoara has been established in 1920 by Royal Decree of King Ferdinand I. It currently has ten faculties, four independent departments and over 1700 teaching and administrative staff, to provide top level support for more than 15000 students. The Department of Computer and Software Engineering is the first department in the field in Romania, being set up in 1964. We appreciate all the efforts and support provided by the local organizers and their institution in hosting this event.

The organizing committee wants to acknowledge and emphasize the efforts of numerous contributors to the success of the IEEE ROSE series, especially to the technical program committee members who volunteered their time to carefully review the manuscripts and provide constructive comments to authors. Special thanks also go to the IEEE Instrumentation and Measurement Society who constantly provides its support and sponsorship to the ROSE conference series, and to Cynda Covert and Chris Dyer from Conference Catalysts for their consistent and thorough assistance to the organization.

Finally, thank you also to all the authors and participants who submitted manuscripts of an excellent quality to ROSE and directly contribute to the success of this conference.

Welcome to ROSE 2014! Enjoy the conference and enjoy your stay in the cosmopolitan, progressive and multi-cultural city of Timișoara, Romania. Thank you for attending.

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Invited Speakers

Dr. Ing. Nicolae Joni

Robcon™ SRL, Timisoara

Title: *Sensors for Robotic Arc Welding Processes*

Abstract – GMAW (Gas Metal Arc Welding) is one of the most important fields of industrial robot applications. In order to successfully implement robotic welding systems, the integrator usually faces difficult challenges that result from the tolerances of the work pieces. This presentation makes a short summary of existing sensor systems, along with example use cases of successful implementations. The sensors used are described both from the functional and from the application point of view.

Biography – Dr. Nicolae Joni is one of Robcon's top engineers and senior researchers. He founded the company in 1990 and is since then its Manager. Specialized in arc and spot welding, he graduated the Politehnica University Timisoara. He obtained his PhD. degree from the Transilvania University in Brasov in the field of robotic arc welding systems. His research interest includes arc welding processes, robotic systems, offline programming systems. He is an author of more than 150 technical papers, 5 books and 2 patents. Dr. Joni is the President of the Romanian Welding Society since 2012 and former Vice-President, during 2006-2012. He is a founding member of the Romanian Society of Robotics (1990) and since 2000 is acting as Vice President. Since 1993 he is a member of the German Association for Welding (DVS). Dr. Joni is an IEEE member since 2010 and a member of the IEEE Robotics and Automation Society since 2011.

Dr. Ing. Valentin Mureşan

Movidius SRL, Timisoara

Title: *Superior Vision: Always on Human-like Vision for Smarter Devices*

Abstract – We live in a world of smart robots, drones and mobile phones/assistants. The technologies behind these products are heralded by low-profile research projects by big name players in the technology sector. The robotic and vision technologies behind these products will shift the applications of electronic devices to a more superior level of intelligence that will change our world. From a hardware point of view, these devices will become a hub of sensors that will be able to capture information about their environment and their context. Probably the most important sense for these devices will be their vision capabilities. To make this sense as close as possible to human vision, will require advanced technology to capture, process, and provide analytics in real time to enable their applications make critical decisions. "Always on" vision capabilities are envisaged as the paradigm for the next generation of mobile applications and in order to make it as close as possible to the human vision, depth perception and estimation are also key along with the image resolution. This Keynote will cover in this context the state of the art in the domain of vision with the latest image processing, computer vision and computational photography algorithms implemented on various low-power processing architectures.

Biography – Dr. Valentin (Val) Mureşan (EEng, MBA, PhD, MIEE, MIEEE), Co-Founder and General Manager, Timisoara at Movidius, is an experienced embedded R&D leader and entrepreneur who built a 50+ Silicon and Software Development Centre and innovation team from scratch in Timisoara, Romania. In that process, dr. Mureşan holds key roles in building and managing a team which develops leading edge products on a tight budget including multi-core silicon and software solutions for real time HD audio, video codecs and processing, computational photography, computer vision, 2D&3D camcorder and camera modules, 2D-3D conversion modules, 3D technology for 2D HDMI TV's and establishing the infrastructure to work with global partners to deliver products on several continents. Dr. Mureşan has also been a director of an EU funded R&D project at Movidius (2010-2012), a Guest Lecturer at West University of Timisoara (2011-2012), Guest Lecturer at Universitatea Politehnica Timisoara (2009-2010), Co-Founder and Design Centre Manager at Movidia (2005-2009), Lecturer at Dublin City University (2002-2005), Research Programme Manager at the Centre for Digital Video Processing - Dublin City University (2001-2005) and Teaching Assistant at Dublin City University (1997-2001).

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