

## WELCOME MESSAGE

After eight successful editions of the IEEE International Symposium on Intelligent Signal Processing, it is our great pleasure to welcome you to the ninth WISP Symposium! The ninth IEEE International Symposium on Intelligent Signal Processing will take place in the enchanting Siena, surrounded by the Tuscan hills, a venue chosen to enhance academic and social interaction between participants, as well as give the event an appropriate setting.

WISP 2015 encourages discussions on the most recent developments and the on-going research related to intelligent signal processing in embedded and/or real time systems. The fundamental idea of WISP is to gather information on all processing aspects related to computer based digital signal processing systems. The attention is mainly focused on analog, digital and mixed signal processing, modeling, diagnostics, control, uncertainty-handling, artificial intelligence, soft computing techniques, anytime algorithms, emerging technologies, adaptive and nonlinear processing, intelligent signal processing, sensors, embedded systems, real-time systems, distributed measurement, diagnostics and control systems, system identification and control, VLSI/ASIC for intelligent signal processing, tool integration for better performance, performance modeling, performance measurement, virtual systems, applications.

Our pleasant duty is to gratefully acknowledge the support provided by the sponsors and co-sponsors of the symposium, to thank the reviewers for their work and all others involved in the preparation of the program and the event. And last but not least, we would like to thank the authors for their valuable contribution!

We wish all participants an enjoyable stay in Siena and a successful symposium!

The Founding General Chair  
**Annamária R. Várkonyi-Kóczy**

The General Co-Chairs  
**Santina Rocchi**  
**Junzo Watada**

## **General information**

### **Venue**

The symposium will take place at the University of Siena, in the San Niccolò Building (rooms 101 and 103).

Address: Via Roma 56, Siena.

### **Registration**

A registration desk will be set up in the close proximity of the conference rooms. It will be open all throughout the symposium for participant registration and information.

### **Language**

The official language of the symposium will be English. No translation will be provided.

### **Presentations**

Presentations can be made by using data projector. All authors are kindly requested to take their presentation on a CD or a USB and upload it on the symposium laptop during the break before their session. Presenters should not use their own laptops.

### **Proceedings and publication**

Accepted papers for oral and poster presentations will be published in the proceedings that will be distributed at the registration. The condition for publication of a paper is that at least one of the authors should register and pay for the symposium.

Please note that only papers that had been presented will be submitted for publication in IEEE eXplore. WISP cannot assure publication in IEEE eXplore, but all presented papers will be submitted for potential publication in eXplore.

### **Lunches**

Lunches will take place on Friday and Saturday in the premises of the San Niccolò Building.

### **Social programs**

A Welcome Cocktail will take place on the first day of the workshop in the San Niccolò Building - included in the registration fee. Should the weather permit it, the dinner will take place in the building courtyard.

The Symposium Dinner will take place on the evening of May 16th at Ristorante Alla Speranza, from 19:00.

# WISP 2015 Program

*Friday, May 15th*

**08:30 Registration**

**9:00 Opening – Professor Santina Rocchi – University of Siena**

**9:10 – 10:10 Plenary 1**

Enrico Magli, *Compressed sensing and sparsity for intelligent information processing*

Chair: Annamária R. Várkonyi-Kóczy

**10:10-10:30 Coffee Break**

**10:30-11:50 Session 1: Real-Time Data Processing and Communication (4)**

Chair: Antonio Ruano

*General Slot Stealing TDMA Scheme to Improve the Low Channel Utilization Factor*

Valentin Stangaciu; Mihai V. Micea; Vladimir Cretu; **Voicu Groza**

*Real-time Imaging Acquisition and Processing System to Improve Fire Protection in Indoor Scenarios*

**Sergio Saponara**; Luca Fanucci

*Submarine Port Egress And Ingress Navigation Using Video Processing*

Twain Glaser; Nicole Nino; **Kathleen A Kramer**; **Stephen C Stubberud**

*A Network of Vibration Measuring Nodes with Integrated Signal Processing for Predictive Maintenance of High Power Transformers*

**Sergio Saponara**; Luca Fanucci; Fabio Bernardo; Alessandro Falciani

**11:55-13:15 Session 2: Intelligent Signal Processing (4)**

Chair: Kathleen A. Kramer

*Genetic Algorithm As Input Signal Generator. Examples, particularities and possible applications*

**Felix Riesco-Pelaez**

*Improved Impedance Analyzer with Binary Excitation Signals*

**Olev Martens**; Raul Land; Mart Min; Paul Annus; Marek Rist; Marko Reidla

*R-Peak Detection Algorithm Based on Differentiation*

Juan Arteaga-Falconi; Hussein Al Osman; **Abdulmotaleb El Saddik**

*TOACOM: A New Cooperative Method of Target Localization by UWB Radar Systems*

**Maria Svecova**; Dusan Kocur

**13:15 Lunch - San Niccolò Building**

### **14:40 – 16:00 Session 3: Image Processing I. (4)**

Chair: Sergio Saponara

*A Fuzzy Approach to Performance Measurement of Grayscale Image Denoising Algorithms*

**Fabrizio Russo**

*A Fast Fuzzy Decision Tree for Color Filtering*

**Balazs Tusor**; Annamária R. Várkonyi-Kóczy; Marta Takacs; János Tóth

*Detecting Pedestrians and Vehicles in Traffic Scene Based on Boosted HOG Features and SVM*

Diqing Sun; **Junzo Watada**

*Relaxation Based Matching of Clusters of Keypoints from Scale-Invariant Feature Transform on Multiple Frames of Buildings*

Sunmin Lee; **Yong Cheol Kim**

### **16:00-16:20 Coffee Break**

### **16:20-18:00 Session 4: Applications (5)**

Chair: Abdulmotaieb El Saddik

*Battery Management System Test Platform Developed for Electric Vehicle Applications*

Lucian Mihet-Popa; **Voicu Groza**

*Electronic Actuation Control Unit with Embedded Energy Storage for Safety-Critical Mechatronic Applications*

**Sergio Saponara**

*Computational Intelligence and Mechatronics Solutions for Robotic Tactile Object Recognition*

Ana-Maria Cretu; Thiago Eustaquio Alves de Oliveira; Vinicius Prado da Fonseca; Bilal Tawbe; Emil M. Petriu; **Voicu Groza**

*DDS Middleware on FlexRay Network: Simulink Blockset Implementation of Wheel's Sub-Blocks and its Adaptation to DDS Concept*

**Abdellaoui Zouhaira**

*A recommender system that deals with items having an image as well as quantitative features*

**Mohammad Reza Azodinia**; Andras Hajdu

### **18:00 Welcome Cocktail - San Niccolò Building**

## ***Saturday, May 16th***

### **9:00 – 10:00 Plenary 2**

Dusan Kocur, *UWB Radar Signal Processing for Human Beings Detection, Localization and Tracking*  
Chair: Voicu Groza

### **10:00-10:20 Coffee Break**

### **10:20-11:40 Parallel Sessions 5**

#### **PS 5A: Neural Network Based Systems (4)**

Chair: Junzo Watada

*Improving a neural networks based HVAC predictive control approach*

**Antonio Ruano**; Sergio Silva; Shabnam Pesteh; Pedro M. Ferreira; Helder Duarte, D.; Gonçalo Mestre; Hamid Reza Khosravani; Ricardo Horta

*A Neural-Network based Intelligent Weather Station*

**Antonio Ruano**; Gonçalo Mestre; Helder Duarte, D.; Sergio Silva; Shabnam Pesteh; Hamid Reza Khosravani; Pedro M. Ferreira; Ricardo Horta

*MOGA Design for Neural Networks Based System for Automatic Diagnosis of Cerebral Vascular Accidents*

**Elmira Hajimani**; Maria Ruano; Antonio Ruano

*Manhattan Rule Training for Memristive Crossbar Circuit Pattern Classifiers*

**Elham Zamanidoost**; Farnood Merrikh-Bayat; Irina Kataeva; Dmitri Strukov

#### **PS 5B: Speech and Acoustic Signal Processing (4)**

Chair: Dusan Kocur

*Design and Testing of Low Cost Three-Modes of Operation Voice Controller for Wheelchairs and Rehabilitation Robotics*

**Mohammed Faeik Ruzaij**; Sebastian Neubert; Norbert Stoll; Kerstin Thurow

*Simple Acoustical Signature Based Coin Validation*

**Olev Martens**; Alina Gavrijaseva; Raul Land; Mart Min

*Multipath Cancellation in Broadband Acoustic Local Positioning Systems*

**Fernando J. Álvarez Franco**; Roberto López-Valcarce

*Voice Activity Detection (VAD) Using Bipolar Pulse Active (BPA) Features*

**Sairul Safie**; Lykourgos Petropoulakis

## 11:45-13:05 Parallel Sessions 6:

### PS6A: Machine Vision and Augmented Reality (3)

Chair: Yong Cheol Kim

*Moving target detection in multi-channel quantum video*

**Fei Yan**; Abdullah M. Ilyasu; Asif R. Khan; Huamin Yang

*Spatial pattern analysis of image local signature for texture and scene recognition*

**Huu Giao Nguyen**; Ronan Fablet; Jean-Marc Boucher

*Dual Quaternion based IMU and Vision Fusion Framework for Mobile Augmented Reality*

**Ashley Varghese**; Girish Chandra; Kriti Kumar

### PS6B: Bioengineering Systems (4)

Chair: Maria da Graca Ruano

*Data Management in Bioengineering Systems*

**Michal Kvet**; Monika Vajsova; Karol Matiaško; Marek Kvet

*SHE based Non Interactive Privacy Preserving Biometric Authentication Protocols*

**Giulia Droandi**; Riccardo Lazzeretti

*Coefficient-Free Blood Pressure Estimation Based on Arterial Lumen Area Oscillations in Oscillometric Methods*

Iraj Koochi; Izmail Batkin; **Voicu Groza**; Shervin Shirmohammadi; Hilmi R Dajani; Saif Ahmad

*Towards the improvement of postural stability through audio bio-feedback*

Massimiliano Todisco; Giovanni Costantini; **Giovanni Saggio**; Daniele Casali; Daniele Giansanti; Giovanni Maccioni

## 13:05 Lunch - San Niccolò Building

### 14:30-16:10 Session 7: Image Processing II. (5)

Chair: Fei Yan

*Panoramic Image mosaic based on SURF algorithm using OpenCV*

Wang Jiayi; **Junzo Watada**

*Spreading Sequences Performance on Time-of-Flight Smart Pixels*

José A. Paredes; Teodoro Aguilera; **Fernando J. Álvarez Franco**; José Moreno; David Gualda

*A Commixed Modified Gram-Schmidt and Region Growing Mechanism for White Blood Cell Image Segmentation*

**Khaled Abuhasel**; Chastine Fatichah; Abdullah M. Ilyasu

*A Tool for Lung Nodules Analysis based on Segmentation and Morphological Operation*

Anindya Gupta; **Olev Martens**; Yannick Le Moullec; Tonis Saar

*A Study on measuring values from data stream used by the Particle Accumulation Theory*

**Shinji Mochida**

## 19:00 Symposium Dinner - Ristorante Alla Speranza

***Sunday, May 17th***

**10:00-12:00**

**Round Table Discussion:** *Compressed Sensing and its Applicability in Different Research Fields*

Moderators: **Voicu Groza** and **Sergio Saponara**