2015
38th International Conference on
Telecommunications and Signal Processing

Program Book

July 9-11, 2015
Prague, Czech Republic
Preface

On behalf of the Organizing Committee of the 2015 38th International Conference on Telecommunications and Signal Processing (TSP), which will be held during July 9-11, 2015, in Clarion Congress Hotel Prague****, Czech Republic, we would like to thank you for your personal support and for your papers which are published in the proceeding. In this respect, we would congratulate you for your success since every paper has been carefully reviewed by the international referees. In cooperation with the technical co-sponsors, IEEE Czechoslovakia Section SP/CAS/COM Joint Chapter and the Investment and Business Development Agency of the Czech Republic (CzechInvest), the TSP 2015 Conference is organized as a forum to promote the exchange of the latest advances in telecommunication technology and signal processing. The aim of the conference is to bring together both novice and experienced scientists, developers, and specialists, to meet new colleagues, collect new ideas, and establish new cooperation between research groups from universities, research centers, and private sectors.

The TSP Conference goes back to 1977, when it was the first time initially organized by enthusiasts from the Department of Telecommunications of Brno University of Technology as a national meeting held in Brno. Because of the success of the first event it was also repeated in 1978 and this annual repetition of the conference became a tradition. In the 1980s, TSP was transformed into an international conference and was opened also to participants from around the word. In the 1990s, during the years of economic transformation in the Czech Republic, TSP extended its base of supporters also by commercial entities active in different fields of telecommunications. In 2008, in cooperation with BME Hungary, the TSP Conference was first time organized abroad. To extend the cooperation between European Universities, in 2011 the organizing committee was joined by other six universities i.e. KTU Turkey, ZUT Poland, VSB Czech Republic, STU Slovak Republic, UL Slovenia, and CTU Czech Republic. We are grateful to them for their contributions.

This year 177 papers have been submitted for presentation and 120 papers been accepted. If we look at the contributions with respect to geographical point of view, it seems that TSP 2015 contributions were submitted from 26 different countries of 4 continents. The large number of papers, support, and feedbacks constantly motivates us in our effort to provide a platform for exchanging information and experience to help to improve the level and extent of scientific cooperation between university students, academics, and employees of research centers. On the other hand, it is great honor to our whole community that you have selected the TSP 2015 Conference to publish and share the results of your hard professional work. It fills us with huge enthusiasm and we are sure you will feel the same enthusiasm from your colleagues, while sharing the results of their research and development work with you. We wish you to enjoy their presentations and gain a lot of new knowledge to help you on your professional way.

Sincerely,

Norbert HERENCSÁR and Karol MOLNÁR
TSP 2015 Organizing Committee Members
General Information:

The Czech Republic is located at the very heart of Central Europe. This small nation boasts a host of spectacular cultural treasures and a varied, rich tapestry of natural wonders. Thanks to increased exports, the interest of foreign investors and the drive of domestic businesspeople, our economy continues to experience dynamic growth.

Currency:

The unit of the Czech currency is the crown - ‘koruna’. Notes are in the following denominations of notes – 5000, 2000, 1000, 500, 200, 100, 50 and 20. Coins – 20, 10, 5, 2, 1. VAT is refundable if the purchase is over 2000 CZK. Credit cards are widely accepted.

Geography:

The new Czech Republic first appeared on the map at the beginning of 1993, after the division of former Czechoslovakia. It is a landlocked country, situated in the Central Europe. It covers an area of 78,864 km².

Climate:

Moderate with four seasons. In winter the weather is variable, in summer it can be very warm. The average temperature in January, the coldest winter month is -5 degrees Centigrade (23 degrees Fahrenheit), in July, the warmest summer month, around +23 degrees Centigrade (73 degrees Fahrenheit).

Time:

GMT +1, the same as in Western Europe.

What One Should Not Fail To See:

Prague: Prague Castle with St. Vitus Cathedral, Belvedere, Loreto, Charles Bridge, Old Town Square and the Old Town Hall with the Astronomical Clock; Jewish Quarter, National Theatre, St. Agnes’s Convent, Lesser Quarter, Wenceslav Square

Brno: Spilberg Castle, St. Peter and Paul Cathedral, The Battle of Austerlitz Monument, vineyards

Cesky Krumlov: Krumlov Castle, Church of St. Vitus, The Hall of Masks, Egon Shiele Centre

Karlovy Vary: Spring Colonnade, mineral bath and hot springs, International Film Festival

Kutná Hora: Cathedral of St. Barbara, Stone House, Ursuline Convent

Krivoklat and Karlstein: Castles in Central Bohemia

Marianske Lazne: The Colonnade, F. Chopin Festival, golf, Tepla Monastery

Lednice: The Castle, Europe’s Garden - natural park

What To Buy:

Bohemian glass, crystal and china, ceramics, wooden toys, local handycraft.

Mains Electricity:

230 V, 50Hz

http://tsp.vutbr.cz/
Conference Venue and Travel

Clarion Congress Hotel Prague****

Freyova 33, CZ – 190 00, Prague 9 – Vysocany, Czech Republic

GPS position: 50°6′35.075″N, 14°30′4.176″E

The TSP 2015 Conference is hosted in the Clarion Congress Hotel Prague. It is situated in a modern part of Prague – Vysocany directly at the Vysocanska underground station (yellow line B), just 15 minutes from the historical centre of Prague and just 20 km from the International Vaclav Havel Airport Prague (PRG). Currently, it is one of the largest and most state-of-the-art congress hotels in the Czech Republic. Within a short period of its existence, it has been awarded several times such as the Best Clarion Hotel of 2009 in Europe and Clarion Hotel of the Year 2012 in Central Europe within the network Choice Hotels International. In 2012 it also became Hotel of the Year in the category of congress hotels in the Czech Hotel Awards competition and received Booking.com 2013 certificate winner and Tripadvisor Certificate of Excellence 2014 Winner. Because of an excellent transport accessibility and a corresponding accommodation capacity (534 Standard or Executive rooms and 25 deluxe suites), the hotel is perfect for hosting the TSP 2015 Conference.

Transportation

From the airport you can get to the Clarion Congress Hotel Prague:

- By taxi – the transport from the Vaclav Havel Airport takes about 30-45 min. (20 km / 12 miles).
- By public transport – the transport from the Vaclav Havel Airport takes about 65 min. The bus no. 100 ends (18-20 min.) at underground station Zlicín from where take the yellow line underground (B), which directly goes through the city centre to Vysocanska, which is directly at the hotel (the price of a public transportation ticket is 32 CZK).

By car:

- Coming from Brno and Vienna via D1 motorway – Follow the D1 highway towards the city centre, turn right to Karlin, Vysocany and follow approximately 5 km. Then turn right on to Ceskomoravavska street going towards the O2 arena. Follow the street for 1 km, then turn left to Freyova street. After approximately 600 m the hotel will be on your left hand side.
- Coming from the North (E55) – Continue along the E55 when entering Prague, turn right at the cross roads with Kolbenova street and head towards the city centre. After approximately 1 km you can see our hotel in front of you.

From the Main Railway Station:

- By taxi – transport from Main Railway Station takes about 15 min. (6.5 km / 4 miles).
- By public transport – the transport from the Main Railway Station takes about 17 min. Firstly take the red line underground (C) from Hlavní nádraži to Florenc (1 stop, 2 min.) from where take the yellow line underground (B) to Vysocanska, which is directly at the hotel (the price of a public transportation ticket is 24 CZK).
Organizing Committee Members

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Sławomir GAJEWSKI, Gdansk University of Technology, Poland
Gabriel GĂŞPĂRESCU, "Politehnica" University of Timisoara, Romania
Ben GAVISH, Southern Methodist University, USA
Gheorghe GAVRилоIA, University of Pitesti, Romania
Eva GESCHEIDTOVÁ, Brno University of Technology, Czech Republic
Mircea GIURGIU, Technical University of Cluj-Napoca, Romania
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Bilgin METIN, Bogazici University, Turkey
Shahram MINAEI, Dagus University, Turkey
Karol MOLNÁR, Honeywell International, s.r.o., Czech Republic
Peter MURPHY, University of Limerick, Ireland
Kimio OGUCHI, Seikei University, Japan
Ali ÖZEN, Nuh Naci Yazgan University, Turkey
Serdar ÖZOĞUZ, Istanbul Technical University, Turkey
Matěj PÁCHA, University of Žilina, Slovak Republic
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Danilo PELOSI, University of Teramo, Italy
Milan POLIVKA, Czech Technical University in Prague, Czech Republic

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Zbyněk RAIDA, Brno University of Technology, Czech Republic
Martin RAKUS, Slovak University of Technology in Bratislava, Slovak Republic
Rastislav RÓKA, Slovak University of Technology in Bratislava, Slovak Republic
Mehmet SAĞBAŞ, Yeni Yüzyıl University, Turkey
Michael H. SCHWARZ, University of Kassel, Germany
Jorge Sá SILVA, University of Coimbra, Portugal
Montree SIRIPRUCHYANUN, King Mongkut’s University of Technology North Bangkok, Thailand
Martin SLANINA, Brno University of Technology, Czech Republic
Zdeněk SMÉKAL, Brno University of Technology, Czech Republic
Kajetana M. SNOPEK, Warsaw University of Technology, Poland
Jordi SOLÉ-CASALS, University of Vic, Catalonia, Spain
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Jan ŠÍSTEK, Czech Technical University in Prague, Czech Republic
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Vladislav ŠKORPIL, Brno University of Technology, Czech Republic
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Rolland VIDA, Budapest University of Technology and Economics, Hungary
Attila VIDÁCS, Budapest University of Technology and Economics, Hungary
Jiří VODRÁŽKA, Czech Technical University in Prague, Czech Republic
Lukáš VOJTĚCH, Czech Technical University in Prague, Czech Republic
Miroslav VOZŇÁK, VŠB-Technical University of Ostrava, Czech Republic
Jan VRBA, Czech Technical University in Prague, Czech Republic
Kamil VRBA, Brno University of Technology, Czech Republic
Ayhan YAZGAN, Karadeniz Technical University, Turkey
Drago ŽAGAR, University of Osijek, Croatia

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<table>
<thead>
<tr>
<th>Time</th>
<th>Room Aquarius</th>
<th>Room Taurus</th>
<th>Room Leo</th>
<th>Room Virgo</th>
<th>Foyer</th>
<th>Hotel Restaurant</th>
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</thead>
<tbody>
<tr>
<td>20:00–21:30</td>
<td>Registration</td>
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<tr>
<td>08:30–18:00</td>
<td>Registration</td>
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<tr>
<td>10:00–10:15</td>
<td>Opening</td>
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<tr>
<td>10:15–10:35</td>
<td>Sponsors' presentation</td>
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<tr>
<td>10:35–11:35</td>
<td>Invited Speech by Sergey Andreev – Intelligent connectivity enablers for converged heterogeneous 5G/IoT ecosystem</td>
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<tr>
<td>12:35–12:50</td>
<td>Photographing</td>
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<td>Lunch (on your own)</td>
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<td>12:50–14:00</td>
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<tr>
<td>14:00–15:45</td>
<td>O01: Network Services and Applications</td>
<td>O02: Modelling, Simulation and Measurement I</td>
<td>O03: Image and Video Signal Processing I</td>
<td>O04: Biomedical Signal Processing I</td>
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<tr>
<td>15:45–16:15</td>
<td>Coffee break</td>
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<tr>
<td>08:30–10:00</td>
<td></td>
<td>O09: Network Technologies I</td>
<td>O10: Modelling, Simulation and Measurement III</td>
<td>O11: Digital Signal Processing I</td>
<td>O12: Radio and Optical Network Technologies</td>
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<tr>
<td>10:00–10:30</td>
<td>Coffee break</td>
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<tr>
<td>10:30–11:30</td>
<td>Invited Speech by Vladimir Sulc – IQRF and IQMESH protocol for wireless mesh networks</td>
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<tr>
<td>11:30–12:30</td>
<td>Invited Speech by Sri Krishnan – Signal feature extraction: methods and applications</td>
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<td>12:30–14:00</td>
<td>Lunch (on your own)</td>
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<td>15:45–16:15</td>
<td>Coffee break</td>
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<tr>
<td>18:00–18:15</td>
<td>Closing Session</td>
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<tr>
<td>20:00–22:00</td>
<td>Galadinner</td>
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<tr>
<td>10:00–14:50</td>
<td>Guided walking tour through historical Prague</td>
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</table>
Program At-a-Glance

Wednesday, 8 July 2015

20:00–21:30 Registration (Foyer)

Thursday, 9 July 2015

08:30–10:00 Registration (Foyer)

10:00–10:15 Opening (Room: Aquarius, Taurus)

10:15–10:35 Sponsors’ presentation (Room: Aquarius, Taurus)

10:35–11:35 Invited Speech by Sergey Andreev (Room: Aquarius, Taurus)

Intelligent connectivity enablers for converged heterogeneous 5G-IoT ecosystem
(W.I.N.T.E.R. Group, Department of Electronics and Communications Engineering, Tampere University of Technology, Finland)

11:35–12:35 Invited Speech by Jiri Matas (Room: Aquarius, Taurus)

Computer Vision A.D. 2015
(Center for Machine Perception, Department of Cybernetics, Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic)

12:35–12:50 Photographing (Room: Aquarius, Taurus)

12:50–14:00 Lunch (on your own) (Hotel Restaurant)

14:00–15:45 O 01: Network Services and Applications (Room: Aquarius)

O 02: Modelling, Simulation and Measurement I (Room: Taurus)

O 03: Image and Video Signal Processing I (Room: Leo)

O 04: Biomedical Signal Processing I (Room: Virgo)

15:45–16:15 Coffee break (Foyer)

16:15–18:00 O 05: Network Security (Room: Aquarius)

O 06: Modelling, Simulation and Measurement II (Room: Taurus)

O 07: Image and Video Signal Processing II (Room: Leo)

O 08: Analog Signal Processing (Room: Virgo)
### Friday, 10 July 2015

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
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<tr>
<td>08:30–10:00</td>
<td>O 09: Network Technologies I (Room: Aquarius)</td>
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<td>O 10: Modelling, Simulation and Measurement III (Room: Taurus)</td>
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<td>O 11: Digital Signal Processing I (Room: Leo)</td>
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<td>O 12: Radio and Optical Network Technologies (Room: Virgo)</td>
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<tr>
<td>10:00–10:30</td>
<td>Coffee break (Foyer)</td>
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<tr>
<td>10:30–11:30</td>
<td>Invited Speech by Vladimir Sulc (Room: Aquarius, Taurus)</td>
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<tr>
<td></td>
<td>IQRF and IQMESH protocol for wireless mesh networks (MICRORISC s.r.o., Czech Republic)</td>
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<tr>
<td>11:30–12:30</td>
<td>Invited Speech by Sri Krishnan (Room: Aquarius, Taurus)</td>
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<tr>
<td></td>
<td>Sri Krishnan – Signal feature extraction: methods and applications</td>
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<td></td>
<td>(Department of Electrical and Computer Engineering, Ryerson University, Toronto, Canada)</td>
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<tr>
<td>12:30–14:00</td>
<td>Lunch (on your own) (Hotel Restaurant)</td>
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<td>14:00–15:45</td>
<td>O 13: Telecommunication Systems I (Room: Aquarius)</td>
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<td>O 14: Audio, Speech and Language Processing (Room: Taurus)</td>
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<td>O 15: Digital Signal Processing II (Room: Leo)</td>
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<td></td>
<td>O 16: Network Technologies II (Room: Virgo)</td>
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<tr>
<td>15:45–16:15</td>
<td>Coffee break (Foyer)</td>
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<td>16:15–18:00</td>
<td>O 17: Telecommunication Systems II (Room: Aquarius)</td>
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<td>O 18: Network Technologies III (Room: Taurus)</td>
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<td>O 19: Biomedical Signal Processing II (Room: Leo)</td>
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<td>O 20: Image and Biomedical Signal Processing (Room: Virgo)</td>
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<tr>
<td>18:00–18:15</td>
<td>Closing Session (Room: Aquarius)</td>
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<tr>
<td>20:00–22:00</td>
<td>Gala Dinner (Hotel Restaurant)</td>
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### Saturday, 11 July 2015

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room</th>
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<tbody>
<tr>
<td>10:00–14:00</td>
<td>Guided walking tour through historical Prague (Optional social event)</td>
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<td>(Meeting point: In front of the theatre Hybernia, yellow metroline B - station Namesti republiky)</td>
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</table>

Invited Speech on Telecommunications

**Sergey Andreev** – Senior Researcher at W.I.N.T.E.R. Group, Department of Electronics and Communications Engineering, Tampere University of Technology, Finland

**Title:** Intelligent connectivity enablers for converged heterogeneous 5G-IoT ecosystem

**Abstract:** In this talk, we comprehensively review recent advancements in radio connectivity enablers at the intersection of the 5G and the IoT realms. We explore the potential of a wide range of devices requiring connectivity at different scales (macro, micro, pico, femto, etc.) and across diverse radio access technologies (e.g., cellular and WLAN) to augment system capacity and improve connectivity experience in next-generation heterogeneous deployments. Further, we discuss the emerging concept of proximate device-to-device communication and the changes it introduces to conventional networking paradigm. We also address the unique challenges posed recently by an impressive variety of machine-type devices, with their characteristic stringent performance requirements, and the capabilities that both short- and long-range radio technologies would need to develop while accommodating those. Finally, we consider the novel spectrum usage paradigms for the future 5G-IoT ecosystem, including millimeter-wave access and licensed shared access techniques. Our study is a combined pursuit of mathematical analysis, system-level simulations, standardization, and production-ready prototyping of the key 5G-IoT solutions.

**Speaker Biography**

Dr. Sergey Andreev is Senior Research Scientist at Tampere University of Technology (Finland), where he is coordinating W.I.N.T.E.R. Group (http://winter-group.net/) focusing on 5G and IoT centric research. He has (co-)authored over 100 papers (including those in IEEE JSAC, IEEE Communications Magazine, and IEEE Wireless Communications), several patents, and a number of IEEE and 3GPP standardization contributions in the areas of multi-radio heterogeneous networking, cooperative and proximate communications, energy efficiency, and machine-to-machine applications. This innovation activity has been well covered in media on both national (Interface science magazine, Finland) and international (Eurescom message, EU) levels. Sergey has been reviewer for numerous visible conferences as well as a large number of top-level international journals, and named Exemplary Reviewer by IEEE Communications Letters in 2013. He has also been invited expert at 5G-PPP Experts Workshop, China-Finland 5G Workshop, held many guest lectures at industry (Intel, Ericsson, NSN, etc.) and academia worldwide. Recently, he has been recipient of highly competitive personal research grant by the Academy of Finland (9% success rate), as well as several other prestigious scholarships and awards.

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Invited Speech on Signal Processing

Jiri Matas – Professor at Center for Machine Perception, Department of Cybernetics, Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic

Title: Computer Vision A.D. 2015

Abstract: In the last fifteen years, computer vision has changed from an academic discipline with a limited impact to a hot, if not overheating, area in which companies like Google, Microsoft, Amazon and Facebook employ dozens or even hundreds of computer vision scientists. The days of algorithms working well on a few images hand-picked by their authors are forgotten, repeatedly we see how short the path from a seminal conference paper to a successful start-up is. In this talk, I will introduce selected algorithms that have led to successful applications and demonstrate the recent shift in computer vision towards method relying heavily on machine learning. Examples include the Viola-Jones sliding window object detection, large-scale image retrieval based on the Bag-of-words method, and categorization with deep convolutional neural nets. I will conclude by discussing a few open problems.

Speaker Biography

Jiri Matas is Professor at the Center for Machine Perception of Czech Technical University in Prague, Czech Republic. Jiří received the MSc degree in cybernetics (with honors) from the Czech Technical University in 1987 and the PhD degree from the University of Surrey, UK, in 1995. His research interests include object recognition, image retrieval, tracking, sequential pattern recognition, invariant feature detection, and Hough Transform and RANSAC-type optimization. Jiří has published more than 200 papers in refereed journals and conferences. His publications have approximately 18,000 citations in Google scholar, and his h-index is 50. He received the best paper prize at the British Machine Vision Conferences in 2002 and 2005 and at the Asian Conference on Computer Vision in 2007. Prof. Matas has served in various roles at major international conferences (e.g. ICCV, CVPR, ICPR, NIPS, ECCV), co-chairing ECCV 2004 and CVPR 2007. He is on the editorial board of IJCV and was the Associate Editor-in-Chief of IEEE Transactions on Pattern Analysis and Machine Intelligence (IEEE T. PAMI).
Invited Speech on Signal Processing

Sri Krishnan – Professor at Department of Electrical and Computer Engineering, Ryerson University, Toronto, Canada

Title: Signal Feature Extraction: Methods and Applications

Abstract: Extraction of features from signals pays an important role in many pattern classification and intelligent systems design. This talk will cover time domain, spectral domain, joint time-frequency domain and sparse domain-based feature extraction techniques. The extraction and classification of complex instantaneous signal features will be also discussed in detail. Applications of the feature extraction methods in the context of multimedia signal processing and biomedical signal processing will also be covered.

Speaker Biography

Sridhar (Sri) Krishnan received the B.E. degree in Electronics and Communication Engineering from Anna University, Madras, India, in 1993, and the M.S. and Ph.D. degrees in Electrical and Computer Engineering from the University of Calgary, Calgary, Alberta, Canada, in 1996 and 1999 respectively. He joined Ryerson University, Toronto, Canada in 1999 and since October 2007 he has been appointed as a Canada Research Chair in Biomedical Signal Analysis. Sri Krishnan has published 230 papers in refereed journals and conferences, and five of his papers have won best paper awards. He is a Fellow of the Canadian Academy of Engineering, Senior Member of IEEE and a member of the Professional Engineers of Ontario. Sri Krishnan is a recipient of many national and provincial awards including the 2013 Achievement in Innovation Award from Innovate Calgary, 2011 Sarwan Sahota Distinguished Scholar Award, 2008 Biodiscovery Award, 2007 Engineer Achievement Award from Engineers Canada; 2006 South Asian Community Achiever Award; 2006 New Pioneers Award in Science and Technology; 2006 Best IEEE Chapter Chair Award (Toronto Section); and 2005 Research Excellence Award from the Faculty of Engineering, Ryerson University.
Invited Industrial Speech

Vladimir Sulc – Co-owner and CEO of MICRORISC s.r.o., Czech Republic

Title: IQRF and IQMESH protocol for wireless mesh networks

Abstract: Wireless mesh networks (WMNs) are nowadays considered and already used as a communication platform for many different applications in the field of telemetry and automation. Brief introduction will disclose background, basic principles, algorithms and challenges related to general WMNs. Further IQRF, an open technological platform for wireless mesh networks, its basic principles and related routing algorithms will be presented. IQMESH protocol will be disclosed at TSP conference and IQRF ecosystem will be first time introduced there as an open technological platform. IQRF provides complete tools to WMNs deployment, reliable and effective packet delivery with minimal demands on system resources. Instead of usage of routing tables, consuming a lot of system resources, it profits from oriented synchronized flooding based on IQMESH protocol. IQMESH network formation, nodes discovery, healing, robustness, latency, protocol specifications and many other technical topics will be disclosed in the presentation in conjunction with real applications deployment.

Speaker Biography

Vladimir Sulc graduated Czech Technical University in Prague, Faculty of Electrical Engineering, in 1992. He is preparing now his dissertation ‘Microelectronics wireless networks for telemetry and building automation’ as PhD candidate at Brno Technical University, Czech Republic. Vladimir Sulc is a founder and CEO of MICRORISC, working from 1991 on many projects related to wireless communication and security. He specializes in LR-WPAN, mesh networking algorithms and encoding. Author or co-author of over 30 patents in CZ, EU, USA, China and Japan. As a leader of several projects granted mainly by Czech Ministry of Industry and Trade he is actively working on projects related to his specialization: Open wireless communication platform. His papers related to mesh networks were awarded by Best Paper Awards at IARIA conferences. As a CEO of MICRORISC he took in 2014 Česká Hlava award, the most prestigious scientific award in the Czech Republic.
### Detailed Conference Programme

**Wednesday, 8 July 2015**

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**Thursday, 9 July 2015**

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<td>10:00-10:15</td>
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<td>10:35-11:35</td>
<td>Invited Speech by Sergey Andreev</td>
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<td></td>
<td><em>Intelligent connectivity enablers for converged heterogeneous 5G-IoT ecosystem</em></td>
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<td>11:35-12:35</td>
<td>Invited Speech by Jiri Matas</td>
<td>Aquarius, Taurus</td>
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<td><em>Computer Vision A.D. 2015</em></td>
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<td>12:35-12:50</td>
<td>Photographing</td>
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<td>12:50-14:00</td>
<td>Lunch (on your own)</td>
<td>Hotel Restaurant</td>
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**Lunch (on your own)**
Thursday, 9 July 2015 14:00-15:45 Aquarius

O 01: Network Services and Applications
Chair: Nasir Ghani, University of South Florida, USA

1. Design of a Tiny Multi-Threaded DNS64 Server
   Gabor Lencse, Budapest University of Technology and Economics, Hungary
   Andras Gabor Soos, Budapest University of Technology and Economics, Hungary

2. Modelling of Virtualized Servers
   Akos Kovacs, Szechenyi Istvan University, Hungary
   Gabor Lencse, Szechenyi Istvan University, Hungary

3. Efficient Distributed Trigger Counting Algorithms for Dynamic Network Topology
   Che-Cheng Chang, National Chung Hsing University, Taiwan
   Jichiang Tsai, National Chung Hsing University, Taiwan

   Andra Pastrav, Technical University of Cluj-Napoca, Romania
   Tudor Palade, Technical University of Cluj-Napoca, Romania
   Emanuel Puschita, Technical University of Cluj-Napoca, Romania

5. ADS-B Based Real-Time Air Traffic Monitoring System
   Mihaly Varga, National Instruments Romania, Romania
   Zsolt Alfred Polgar, Technical University of Cluj-Napoca, Romania
   Horia Hedesiu, National Instruments Romania, Romania

6. Feasibility Analysis of ITU-T P.1201 Amd.2 Standard for Video on Demand Services
   Boris Filipov, State University of Aerospace Instrumentation, Russia
   Dominik Kovac, Brno University of Technology, Czech Republic
   Dalibor Uhlir, Brno University of Technology, Czech Republic
   Jiri Hosek, Brno University of Technology, Czech Republic
   Marat Gilmutdinov, State University of Aerospace Instrumentation, Russia
   Sergey Andreev, Tampere University of Technology, Finland

http://tsp.vutbr.cz/
### O 02: Modelling, Simulation and Measurement I

**Chair:** Ali Emre Pusane, Bogazici University, Turkey

| 1. | **Multi-Path Route Discovery Algorithm for Cognitive Radio Ad Hoc Networks Using Algebraic Connectivity**  
 Erkan Guler, Giresun University, Turkey  
 Zhaleh Sadreddini, Avrasya University, Turkey  
 Tugrul Cavdar, Karadeniz Technical University, Turkey |
|---|---|
| 2. | **Estimating Heterogeneous Traffics in CSMA Networks at Runtime**  
 Shuanglong Xie, Nanyang Technological University, Singapore  
 Kay Soon Low, Nanyang Technological University, Singapore  
 Erry Gunawan, Nanyang Technological University, Singapore |
| 3. | **Modelling the Impact of Network Features on Speech Quality in Voice over IP**  
 Jan Rozhon, VSB - Technical University of Ostrava, Czech Republic  
 Filip Rezac, VSB - Technical University of Ostrava, Czech Republic  
 Jiri Slachta, VSB - Technical University of Ostrava, Czech Republic  
 Miroslav Voznak, VSB - Technical University of Ostrava, Czech Republic |
| 4. | **VM Migration Measurement and Failure Detection**  
 Tomas Kukral, Czech Technical University in Prague, Czech Republic  
 Milos Kozak, Czech Technical University in Prague, Czech Republic  
 Tomas Hegr, Czech Technical University in Prague, Czech Republic  
 Leos Bohac, Czech Technical University in Prague, Czech Republic |
| 5. | **On Lower Estimating Internet Queuing Delay**  
 Attila Csoma, Budapest University of Technology and Economics, Hungary  
 Laszlo Toka, Budapest University of Technology and Economics, Hungary  
 Andras Gulyas, Budapest University of Technology and Economics, Hungary |
| 6. | **Verification of Genetic Algorithm in Dynamic Traffic Light Management**  
 Radek Fujdiak, Brno University of Technology, Czech Republic  
 Jiri Misurec, Brno University of Technology, Czech Republic  
 Petr Mlynek, Brno University of Technology, Czech Republic  
 Tomas Petrak, Brno University of Technology, Czech Republic |
### O 03: Image and Video Signal Processing I

**Chair:** Sri Krishnan, Ryerson University, Canada

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<td><strong>Image Forgery Detection Using Colour Moments</strong></td>
<td>Beste Ustubioglu, Karadeniz Technical University, Turkey</td>
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<td><strong>Vasif Nabiye</strong>, Karadeniz Technical University, Turkey</td>
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<td><strong>Guzin Ulutas</strong>, Karadeniz Technical University, Turkey</td>
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<td><strong>Mustafa Ulutas</strong>, Karadeniz Technical University, Turkey</td>
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<td>2.</td>
<td><strong>Identification of Acrylamide in Fried Potato Crisps Using Image Processing in Wavelet Domain</strong></td>
<td>Anushikha Singh, Amity University, India</td>
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<td><strong>Malay Kishore Dutta</strong>, Amity University, India</td>
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<td><strong>Radim Burget</strong>, Brno University of Technology, Czech Republic</td>
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<td><strong>Jan Masek</strong>, Brno University of Technology, Czech Republic</td>
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<td>3.</td>
<td><strong>DCT Based Image Watermarking Method with Dynamic Gain</strong></td>
<td>Arda Ustubioglu, Karadeniz Technical University, Turkey</td>
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<td><strong>Guzin Ulutas</strong>, Karadeniz Technical University, Turkey</td>
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<td><strong>Mustafa Ulutas</strong>, Karadeniz Technical University, Turkey</td>
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<td>4.</td>
<td><strong>A Hierarchical Feature Search Method for Wine Label Image Recognition</strong></td>
<td>Mei-Yi Wu, National Kaohsiung University of Hospitality and Tourism, Taiwan</td>
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<td><strong>Jia-Hong Lee</strong>, National Kaohsiung First University of Science and Technology, Taiwan</td>
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<td><strong>Shu-Wei Kuo</strong>, National Kaohsiung First University of Science and Technology, Taiwan</td>
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<td>5.</td>
<td><strong>Influence of LTE Uplink System on DVB-T System at Different Coexistence Scenarios</strong></td>
<td>Ladislav Polak, Brno University of Technology, Czech Republic</td>
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<td><strong>Denis Plaisner</strong>, Brno University of Technology, Czech Republic</td>
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<td><strong>Ondrej Kaller</strong>, Brno University of Technology, Czech Republic</td>
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<td><strong>Tomas Kratochvil</strong>, Brno University of Technology, Czech Republic</td>
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<td>6.</td>
<td><strong>Pixel Level jointed Sparse Representation with RPCA Image Fusion Algorithm</strong></td>
<td>Rasha Ibrahim, Ryerson University, Canada</td>
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<td><strong>Javad Alirezaie</strong>, Ryerson University, Canada</td>
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<td><strong>Paul Babyn</strong>, University of Saskatoon, Canada</td>
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1. **An Evaluation Method of Complex Movement of the Arm During Walking Based on Gyroscope Data and Angle-angle Diagram**
   Lenka Hanakova, Czech Technical University in Prague, Czech Republic
   Patrik Kutilek, Czech Technical University in Prague, Czech Republic
   Vladimir Socha, Czech Technical University in Prague, Czech Republic
   David Skoda, Czech Technical University in Prague, Czech Republic
   Peter Takac, Pavol Jozef Safarik University in Kosice, Slovakia
   Jakub Schlenker, Czech Technical University in Prague, Czech Republic
   Zdenek Svoboda, Palacky University of Olomouc, Czech Republic

2. **Impact of Low Frequency Electromagnetic Field Exposure on Selected Microorganisms**
   Ivona Malikova, University of Zilina, Slovakia
   Ladislav Janousek, University of Zilina, Slovakia
   Vladyslava Fantova, Czech Technical University in Prague, Czech Republic
   Jaroslav Jira, Czech Technical University in Prague, Czech Republic
   Vitezslav Kríha, Czech Technical University in Prague, Czech Republic

3. **Detection of Diabetic Macular Edema in Retinal Images Using a Region Based Method**
   Namita Sengar, Amity University, India
   Malay Kishore Dutta, Amity University, India
   Radim Burget, Brno University of Technology, Czech Republic
   Lukas Povoda, Brno University of Technology, Czech Republic

4. **Automatic Glaucoma Detection using Adaptive Threshold based Technique in Fundus Image**
   Ayushi Agarwal, Amity University, India
   Shradha Gulia, Amity University, India
   Akshita Jain, Amity University, India
   Malay Kishore Dutta, Amity University, India
   Radim Burget, Brno University of Technology, Czech Republic
   Jiri Prinosil, Brno University of Technology, Czech Republic

5. **An Efficient Automatic Intensity Based Method for Detection of Macula in Retinal Images**
   Arpit Bansal, Amity University, India
   Aashwin Vats, Amity University, India
   Malay Kishore Dutta, Amity University, India
   Radim Burget, Brno University of Technology, Czech Republic
   Jiri Prinosil, Brno University of Technology, Czech Republic

6. **Performance Study of Wavelet-Based ECG Analysis for ST-Segment Detection**
   Nobuaki Fujita, University of Tsukuba, Japan
   Akira Sato, University of Tsukuba, Japan
   Masatoshi Kawarasaki, University of Tsukuba, Japan
Thursday, 9 July 2015 15:45-16:15  Foyer
Coffee break

Thursday, 9 July 2015 16:15-18:00  Aquarius

O 05: Network Security
Chair: Ladislav Polak, Brno University of Technology, Czech Republic

1. Practical Privacy-Enhancing Technologies
   Jan Hajny, Brno University of Technology, Czech Republic
   Lukas Malina, Brno University of Technology, Czech Republic
   Petr Dzurenda, Brno University of Technology, Czech Republic

2. Secure Electronic Voting Based on Group Signatures
   Lukas Malina, Brno University of Technology, Czech Republic
   Jan Smrz, Brno University of Technology, Czech Republic
   Jan Hajny, Brno University of Technology, Czech Republic
   Kamil Vrba, Brno University of Technology, Czech Republic

3. A Feature Selection Approach implemented with the Binary Bat Algorithm applied for Intrusion Detection
   Adriana-Cristina Enache, University Politehnica of Bucharest, Romania
   Valentin Sgarciu, University Politehnica of Bucharest, Romania

4. Power Analysis Attack Based on the MLP in DPA Contest v4
   Zdenek Martinasek, Brno University of Technology, Czech Republic
   Ondrej Zapletal, Brno University of Technology, Czech Republic
   Kamil Vrba, Brno University of Technology, Czech Republic
   Krisztina Trasy, Mendel University in Brno, Czech Republic

5. A Linear Programming Scheme for IPS Traffic Scheduling
   Jorge Crichtigno, Northern New Mexico University, USA
   Nasir Ghani, University of South Florida, USA

6. Qualitative And Security Parameters Inside Middleware Centric Heterogeneous RFID/IoT Networks, On-Tag Approach
   Lukas Kypus, Czech Technical University in Prague, Czech Republic
   Lukas Vojtech, Czech Technical University in Prague, Czech Republic
   Lukas Kvarda, Czech Technical University in Prague, Czech Republic
1. The Development Process and Testing of an AC – DC Power Supply  
   Roland Szabo, Politehnica University of Timisoara, Romania  
   Aurel Gontean, Politehnica University of Timisoara, Romania

2. Method for Benchmarking Single Board Computers for Building a Mini Supercomputer for Simulation of Telecommunication Systems  
   Gabor Lencse, Szchenyi Istvan University, Hungary  
   Sandor Repas, Szchenyi Istvan University, Hungary

3. Evaluation of Multimodal Fusion Methods Using Integration Patterns Modeling  
   Roman Hak, Czech Technical University in Prague, Czech Republic  
   Tomas Zeman, Czech Technical University in Prague, Czech Republic

4. Evolution Models for Dynamic Networks  
   Pedro J. Zufiria, Technical University of Madrid, Spain  
   Iker Barriales-Valbuena, Technical University of Madrid, Spain

5. On the Reliability and Efficiency of Novel Programming Architectures for Next-Generation Flash Memories  
   Reza Ashrafi, Bogazici University, Turkey  
   Ali E. Pusane, Bogazici University, Turkey  
   Ismail Demirkan, Istanbul Sehir University, Turkey

6. The Effect of PIN Diode Characteristics on the Antenna Reconfiguration Part of Cognitive Radio  
   Ayhan Yazgan, Karadeniz Technical University, Turkey  
   Hakki Cavdar, Karadeniz Technical University, Turkey  
   Haydar Kaya, Karadeniz Technical University, Turkey

7. Measured Signal Identification and Temperature Controller Design for a HIPEC Device  
   Iulia Clitan, Technical University of Cluj-Napoca, Romania  
   Vlad Muresan, Technical University of Cluj-Napoca, Romania  
   Daniel Moga, Technical University of Cluj-Napoca, Romania  
   Valentin Sita, Technical University of Cluj-Napoca, Romania  
   Corneliu Lungoci, „Iuliu Hatieganu” University of Medicine and Pharmacy Cluj-Napoca, Romania
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<td>1.</td>
<td>A SONAR Images Conditioning System in the Wavelets Domain</td>
<td>Cristina Stolojescu-Crisan, Politehnica University of Timisoara, Romania</td>
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<td>An Inverse Halftoning Algorithm Based on Neural Networks and UP(x) Atomic Function</td>
<td>Fernando Pelcastre-Jimenez, National Polytechnic Institute, Mexico</td>
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<td>Mariko Nakano-Miyatake, National Polytechnic Institute, Mexico</td>
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<td>Karina Toscano-Medina, National Polytechnic Institute, Mexico</td>
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<td>Gabriel Sanchez-Perez, National Polytechnic Institute, Mexico</td>
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<td>Hector Perez-Meana, National Polytechnic Institute, Mexico</td>
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<td>Semi-fragile Watermarking-based Color Image Authentication with Recovery Capability</td>
<td>Luis Rosales-Roldan, Chuo University, Japan</td>
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<td>Manuel Cedillo-Hernandez, National Autonomous University of Mexico, Mexico</td>
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<td>Jinhui Chao, Chuo University, Japan</td>
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<td>Mariko Nakano-Miyatake, National Polytechnic Institute, Mexico</td>
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<td>Hector Perez-Meana, National Polytechnic Institute, Mexico</td>
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<td>A Design of a GP-GPU based Stream Processor for an Image Processing</td>
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<td>Gyutaek Kyung, NEXTCHIP Co., Ltd., Republic of Korea</td>
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<td>Tae Ryong Park, Seokyeong University, Republic of Korea</td>
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<td>Jae Chang Kwak, Seokyeong University, Republic of Korea</td>
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<td>Yong Seo Koo, Dankook University, Republic of Korea</td>
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<td>5.</td>
<td>Edge Based Block Wise Selective Fingerprint Image Encryption Using Chaos</td>
<td>Garima Mehta, Amity University, India</td>
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<td>Malay Kishore Dutta, Amity University, India</td>
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<td>Vaclav Uher, Brno University of Technology, Czech Republic</td>
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<td>6.</td>
<td>Image Quality Measurement for Low-Dose Human Lung CT Scans</td>
<td>Gergo Bognar, Eotvos L. University, Hungary</td>
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1. Arbitrary Phase Shifters with Increasing Phase  
   Jiri Petrzelka, Brno University of Technology, Czech Republic

2. Utilization of DVCC Element for Modeling Driven Nonlinear Dynamics  
   Jiri Petrzelka, Brno University of Technology, Czech Republic

3. Novel Current Controlled Differential-Input Buffered Output Active Element and its Application in All-Pass Filter  
   Fabian Khateb, Brno University of Technology, Czech Republic  
   Salma Bay Abo Dabbous, Brno University of Technology, Czech Republic  
   Montree Kumngern, King Mongkut’s Institute of Technology Ladkrabang, Thailand  
   Tomasz Kulej, Czestochowa University of Technology, Poland

4. Applications of a CMOS Current Squaring Circuit in Analog Signal Processing  
   Ali Naderi Saatlo, Urmia Azad University, Iran  
   Serdar Ozoguz, Istanbul Technical University, Turkey  
   Shahram Minaei, Dogus University, Turkey

5. Current-Mode Full-Wave Rectifier Circuits Using Current Differencing Buffered Amplifier  
   Suleyman Erkan, Yildiz Technical University, Turkey  
   Umut Engin Ayten, Yildiz Technical University, Turkey  
   Mehmet Sagbas, Yeni Yuzil University, Turkey

6. Two Behavioral Models of the Electronically Controlled Generalized Current Conveyor of the Second Generation  
   Jan Jerabek, Brno University of Technology, Czech Republic  
   Roman Sotner, Brno University of Technology, Czech Republic  
   Aslihan Kartci, Yildiz Technical University, Turkey  
   Norbert Herencsar, Brno University of Technology, Czech Republic  
   Tomas Dostal, College of Polytechnics Jihlava, Czech Republic  
   Kamil Vrba, Brno University of Technology, Czech Republic

7. Behavioral Models of Current Conveyor of Second Generation with Advanced Controllable Inter-Terminal Relations  
   Roman Sotner, Brno University of Technology, Czech Republic  
   Jan Jerabek, Brno University of Technology, Czech Republic  
   Aslihan Kartci, Yildiz Technical University, Turkey  
   Norbert Herencsar, Brno University of Technology, Czech Republic  
   Roman Prokop, Brno University of Technology, Czech Republic  
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<td>Modern Physical Access Control Systems and Privacy Protection</td>
<td>Petr Dzurenda, Brno University of Technology, Czech Republic</td>
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<td>Vaclav Zeman, Brno University of Technology, Czech Republic</td>
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<td>Kamil Vrba, Brno University of Technology, Czech Republic</td>
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<td>2</td>
<td>Security and Privacy in the Smart Grid Services</td>
<td>Lukas Malina, Brno University of Technology, Czech Republic</td>
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<td>Jan Hajny, Brno University of Technology, Czech Republic</td>
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<td>Kamil Vrba, Brno University of Technology, Czech Republic</td>
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<td>3</td>
<td>Modern Network Vulnerabilities and Security Testing – Actual Threats</td>
<td>Michal Polivka, Brno University of Technology, Czech Republic</td>
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<td>Vaclav Oujezsky, Brno University of Technology, Czech Republic</td>
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<td>Vladislav Skorpil, Brno University of Technology, Czech Republic</td>
</tr>
<tr>
<td>4</td>
<td>Unilateral Authentication on Low-cost Devices</td>
<td>Vlastimil Clupek, Brno University of Technology, Czech Republic</td>
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<td></td>
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<td>Vaclav Zeman, Brno University of Technology, Czech Republic</td>
</tr>
<tr>
<td>5</td>
<td>Some Results on Intrusion and Anomaly Detection Using Signal Processing and NEAR System</td>
<td>Florin Vancea, University of Oradea, Romania</td>
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<td></td>
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<td>Codruta Vancea, University of Oradea, Romania</td>
</tr>
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</table>
Friday, 10 July 2015 8:30-10:00 Taurus

O 10: Modelling, Simulation and Measurement II
Chair: Sergey Andreev, Tampere University of Technology, Finland

1. Infrared Based Clinical Landmark Determination For Ultrasound Image Acquisition
   Christina Pahl, Ilmenau University of Technology, Germany
   Eko Supriyanto, Universiti Teknologi Malaysia, Malaysia

2. Application of Linguistic Fuzzy-Logic Control in Fast and Sensitive Technological Processes
   Radim Farana, University of Ostrava, Czech Republic
   Bogdan Walek, University of Ostrava, Czech Republic
   Michal Janosek, University of Ostrava, Czech Republic
   Jaroslav Zacek, University of Ostrava, Czech Republic

3. The Milstein Numerical Scheme in Solving Stochastic Second Order Networks
   Edita Kolarova, Brno University of Technology, Czech Republic
   Lubomir Brancik, Brno University of Technology, Czech Republic

4. The Effect of Line of Sight Propagation on Performance of Amplify-and-Forward Relay Networks
   Maja Delibasic, University of Montenegro, Montenegro
   Milica Pejanovic-Djurisic, University of Montenegro, Montenegro

5. Risk Assessment Based LTE HetNet Uplink Power and Interference Control
   Pavlina Koleva, Technical University of Sofia, Bulgaria
   Plamen Semov, Technical University of Sofia, Bulgaria
   Oleg Asenov, St. Kiril and St. Metodius University of Veliko Tarnovo, Bulgaria
   Vladimir Poulkov, Technical University of Sofia, Bulgaria

   Aleksandar Minja, University of Novi Sad, Serbia
   Ivan Stanojevic, University of Novi Sad, Serbia
   Vojin Senk, University of Novi Sad, Serbia
O 11: Digital Signal Processing I

Chair: Ram Narayanan, The Pennsylvania State University, USA

1. Impact of Beamspace Processing on Accuracy of DOA Estimation using MUSIC and Capon Methods
   Yuri Nechaev, Voronezh State University, Russia
   Ilia Peshkov, Bunin Yelets State University, Russia

2. Using the Q Measure to Create Panoramic Photographs
   Janusz Kowalski, Pomeranian Medical University, Poland
   Jakub Peksinski, West Pomeranian University of Technology, Poland
   Grzegorz Mikolajczak, West Pomeranian University of Technology, Poland

3. A Novel Power-line Oriented DFT Method with Error Elimination at Off-line Frequency Operation
   Predrag Ninkovic, Electrical Engineering Institute Nikola Tesla, Serbia
   Marko Jankovic, Electrical Engineering Institute Nikola Tesla, Serbia

4. Highly Non-Stationary Interference Suppression in Direct Sequence Spread-Spectrum Systems
   Slobodan Djukanovic, University of Montenegro, Montenegro
   Marko Simeunovic, University of Montenegro, Montenegro
   Igor Djurovic, University of Montenegro, Montenegro

5. On Bayesian Decision-Making and Approximation of Probability Densities
   Milan Papez, Brno University of Technology, Czech Republic

6. A Robust Algorithm Based on Wavelet Transform for Recognition of Binary Digital Modulations
   Salman Hassanpour, Sharif University of Technology, Iran
   Amir Mansour Pezeshk, Sharif University of Technology, Iran
   Fereidoon Behnia, Sharif University of Technology, Iran
1. **Broadband Analog Electro-Optic Transmission System with the Ultimate Galvanic Isolation Capability**  
   Jiri Svarny, University of West Bohemia, Czech Republic

2. **Lightweight and Flexible Structures for Electromagnetic Interference Shielding - Present State**  
   Veronika Safarova, Technical University of Liberec, Czech Republic  
   Jiri Militky, Technical University of Liberec, Czech Republic

3. **Cooperative Spectrum Sensing Schemes for Cognitive Radios Using Dynamic Spectrum Auctions**  
   Lukas Sendrei, Technical University of Kosice, Slovakia  
   Jan Pastircak, Technical University of Kosice, Slovakia  
   Stanislav Marchevsky, Technical University of Kosice, Slovakia  
   Juraj Gazda, Technical University of Kosice, Slovakia

4. **IR Transparent Grid Millimeter-Wave Antenna**  
   Xubo Zhu, Luoyang Optoelectro Technology Development Center, China  
   Ning An, Luoyang Optoelectro Technology Development Center, China  
   Liang Zhao, Luoyang Optoelectro Technology Development Center, China  
   Mo Li, Luoyang Optoelectro Technology Development Center, China  
   Weiguo Sun, Luoyang Optoelectro Technology Development Center, China

5. **Multi-Period Logical Topology Design for IP-over-WDM Network with Mixed Line Rates**  
   Bingbing Li, Chonbuk National University, Republic of Korea  
   Young-Chon Kim, Chonbuk National University, Republic of Korea

6. **Transmission Convergence Layer in XG-PON**  
   Lukas Koci, Brno University of Technology, Czech Republic  
   Tomas Horvath, Brno University of Technology, Czech Republic  
   Petr Munster, Brno University of Technology, Czech Republic  
   Michal Jurcik, Brno University of Technology, Czech Republic  
   Miloslav Filka, Brno University of Technology, Czech Republic
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<tr>
<td>Friday, 10 July 2015</td>
<td>10:00-10:30</td>
<td>Foyer</td>
<td>Coffee break</td>
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| Friday, 10 July 2015 | 10:30-11:30    | Aquarius, Taurus | Invited Speech by Vladimir Sulc  
*IQRF and IQMESH protocol for wireless mesh networks* |
| Friday, 10 July 2015 | 11:30-12:30    | Aquarius, Taurus | Invited Speech by Sri Krishnan  
*Signal feature extraction: methods and applications* |
| Friday, 10 July 2015 | 12:30-14:00    | Hotel Restaurant | Lunch (on your own)                                                             |
O 13: Telecommunication Systems I
Chair: Jichiang Tsai, National Chung Hsing University, Taiwan

<table>
<thead>
<tr>
<th></th>
<th>Topic</th>
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<tr>
<td>1</td>
<td>Design of Reconfigurable Shaped Offset Quadrature Phase Shift Keying (SOQPSK) Transmitter on Field Programmable Gate Array (FPGA)</td>
<td>Gorakh Nath Chaubey, Defence Institute of Advance Technology, DRDO, India&lt;br&gt;Chinmoy Bhattacharya, Defence Institute of Advance Technology, DRDO, India</td>
</tr>
<tr>
<td>2</td>
<td>High Accuracy Hilbert Transformer Realization for Multicarrier Communications</td>
<td>Kamelia Nikolova, Technical University of Sofia, Bulgaria&lt;br&gt;Miglen Ovcharov, Visteon Electronics, Bulgaria&lt;br&gt;Georgi Iliev, Technical University of Sofia, Bulgaria&lt;br&gt;Vladimir Poulkov, Technical University of Sofia, Bulgaria</td>
</tr>
<tr>
<td>3</td>
<td>Column Weights Optimization for Semi-Regular Nonbinary LDPC Codes</td>
<td>Wojciech Sulek, Silesian University of Technology, Poland&lt;br&gt;Marcin Kucharczyk, Silesian University of Technology, Poland</td>
</tr>
<tr>
<td>4</td>
<td>MMSE Precoder for Multipath Channels with Imperfectly Known State Information</td>
<td>Inna Dvorakova, Voronezh State University, Russia&lt;br&gt;Alexander Malyutin, JVS “Sozvezdie Concern”, Russia&lt;br&gt;Yuri Nechaev, Voronezh State University, Russia</td>
</tr>
<tr>
<td>5</td>
<td>On the Turbo Coded Bits Allocation Mode for the 64-QAM Square Modulation</td>
<td>Radu Lucaciu, Politehnica University of Timisoara, Romania&lt;br&gt;Maria Kovaci, Politehnica University of Timisoara, Romania&lt;br&gt;Janos Gal, Politehnica University of Timisoara, Romania&lt;br&gt;Adrian Mihaescu, Politehnica University of Timisoara, Romania&lt;br&gt;Horia Balta, Politehnica University of Timisoara / Valahia University of Targoviste, Romania</td>
</tr>
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</table>
1. **Comparison between Emotion Transformation Algorithms of Speech Signal using Spectral Mapping Techniques**  
Bageshree Sathe-Pathak, Priyadarshini College of Engineering / Cummins College of Engineering for Women, India  
Anita Patil, Priyadarshini College of Engineering / Cummins College of Engineering for Women, India  
Ashish Panat, KCNIT, Priyadarshini College of Engineering, India

2. **On Transcribing Informally-Pronounced Numbers in Romanian Speech**  
Horia Cucu, University Politehnica of Bucharest, Romania  
Alexandru Caranica, University Politehnica of Bucharest, Romania  
Andi Buzo, University Politehnica of Bucharest, Romania  
Corneliu Burileanu, University Politehnica of Bucharest, Romania

3. **Adaptive Noise Suppression in Voice Communication Using a Neuro-Fuzzy Inference System**  
Radek Martinek, VSB - Technical University of Ostrava, Czech Republic  
Michal Kelnar, VSB - Technical University of Ostrava, Czech Republic  
Jan Vanus, VSB - Technical University of Ostrava, Czech Republic  
Petr Koudelka, VSB - Technical University of Ostrava, Czech Republic  
Petr Bilik, VSB - Technical University of Ostrava, Czech Republic  
Jiri Koziorek, VSB - Technical University of Ostrava, Czech Republic  
Jan Zidek, VSB - Technical University of Ostrava, Czech Republic

4. **An Evolutionary Optimization Methodology of a Low-Power Programmable Cochlear Implant**  
Paul Farago, Technical University of Cluj-Napoca, Romania  
Claudia Farago, Technical University of Cluj-Napoca, Romania  
Robert Groza, Technical University of Cluj-Napoca, Romania  
Sorin Hintea, Technical University of Cluj-Napoca, Romania

5. **Vowel Polygon Efficiency Induced by Middle Level Psychological Stress**  
Miroslav Stanek, Brno University of Technology, Czech Republic

6. **Objective Quality Assessment for the Acoustic Zoom**  
Frantisek Rund, Czech Technical University in Prague, Czech Republic  
Hasan Khaddour, Brno University of Technology, Czech Republic  
Jiri Schimmel, Brno University of Technology, Czech Republic  
Jaroslav Bouse, Czech Technical University in Prague, Czech Republic
<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
</table>
| 1.  | **Random Distributed Angle-of-arrival Parameter Estimation Technique for Visible Light Positioning** | Yong Up Lee, Hallym University, Republic of Korea  
Sang-Myeong Lee, Hallym University, Republic of Korea |
| 2.  | **Formant-based Feature Extraction for Emotion Classification from Speech** | Jonathan C. Kim, Georgia Institute of Technology, USA  
Mark A. Clements, Georgia Institute of Technology, USA |
| 3.  | **Analysis on the Electroretinography Response for Flickering and Current Stimulations** | Christina Pahl, Ilmenau University of Technology, Germany  
Norhasmira Binti Mohammad, Universiti Teknologi Malaysia, Malaysia  
Eko Supriyanto, Universiti Teknologi Malaysia, Malaysia |
| 4.  | **Statistical and Mathematical Classification of Direct Punch** | Dora Lapkova, Tomas Bata University in Zlin, Czech Republic  
Milan Adamek, Tomas Bata University in Zlin, Czech Republic |
| 5.  | **Presenting Nonlinear Synchronous Common Spatial Pattern for Cue-based BCI** | Tannaz Hadiyan, Shiraz University, Iran  
Reza Boostani, Shiraz University, Iran |
| 6.  | **Objective Empirical Mode Decomposition metric** | Dawid Laszuk, University of Reading, United Kingdom  
Oswaldo Cadenas, University of Reading, United Kingdom  
Slawomir J. Nasuto, University of Reading, United Kingdom |
1. **Wireless Barrage on the Railway Crossing**  
   Martin Tomis, VSB - Technical University of Ostrava, Czech Republic  
   Marek Dvorsky, VSB - Technical University of Ostrava, Czech Republic  
   Vitezslav Styskala, VSB - Technical University of Ostrava, Czech Republic  
   Tomas Soural, C-MODUL, spol. s r.o., Czech Republic  
   Tomas Krenzelok, C-MODUL, spol. s r.o., Czech Republic  
   Tomas Soural, C-MODUL, spol. s r.o., Czech Republic

2. **HetNet Handover Performance Analysis Based on RSRP vs. RSRQ Triggers**  
   Ionel Petrut, Politehnica University Timisoara / Alcatel-Lucent, Romania  
   Marius Otesteanu, Politehnica University Timisoara, Romania  
   Cornel Balint, Politehnica University Timisoara, Romania  
   Georgeta Budura, Politehnica University Timisoara, Romania

3. **Forecasting Electricity Consumption in Czech Republic**  
   Vaclav Uher, Brno University of Technology, Czech Republic  
   Radim Burget, Brno University of Technology, Czech Republic  
   Malay Kishore Dutta, Amity University, India  
   Petr Mlynek, Brno University of Technology, Czech Republic

4. **Stability Analysis and Performance Comparison of Three 6to4 Relay Implementations**  
   Sandor Repas, Szechenyi Istvan University, Hungary  
   Viktor Horvath, Szechenyi Istvan University, Hungary  
   Gabor Lencse, Szechenyi Istvan University, Hungary

5. **IEEE 1451 Compliant Smart HART Modem**  
   Gabriel Gasparesc, Politehnica University of Timisoara, Romania  
   Petru Papazian, Politehnica University of Timisoara, Romania  
   Mircea Babaita, Politehnica University of Timisoara, Romania

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**Friday, 10 July 2015**  
**15:45-16:15**  
**Foyer**

**Coffee break**
1. **Micro Mobility Management for Heterogeneous Networks in LTE-A**  
   Min-Soo Woo, Korea University, Republic of Korea  
   Seong-Mun Kim, Korea University, Republic of Korea  
   Seung-Eun Hong, Electronics and Telecommunications Research Institute, Republic of Korea  
   Sung-Gi Min, Korea University, Republic of Korea  

2. **Vehicular Ad Hoc Networks: Multi-Hop Information Dissemination in an Urban Scenario**  
   Markus Hager, Technical University of Ilmenau, Germany  
   Luise Wernecke, Technical University of Munich, Germany  
   Christian Schneider, Technical University of Ilmenau, Germany  
   Jochen Seitz, Technical University of Ilmenau, Germany  

3. **A Blind Signal Processing Method for Assessing Users’ Movements in Indoor Wi-Fi Communications by Android-based Smartphones**  
   Antonio Tedeschi, Universita degli Studi Roma Tre, Italy  
   Francesco Benedetto, Universita degli Studi Roma Tre, Italy  
   Luca Paglione, Universita degli Studi Roma Tre, Italy  

4. **UHF RFID Tag Design for Disaster Management**  
   Lukas Vojtech, Czech Technical University in Prague, Czech Republic  
   Jiri Skapa, Czech Technical University in Prague, Czech Republic  
   Radoslav Bortel, Czech Technical University in Prague, Czech Republic  
   Tomas Korinek, Czech Technical University in Prague, Czech Republic  
   Marek Neruda, Czech Technical University in Prague, Czech Republic  

5. **Efficient Routing and Spectrum Allocation Considering QoT in Elastic Optical Networks**  
   Bingbing Li, Chonbuk National University, Republic of Korea  
   Young-Chon Kim, Chonbuk National University, Republic of Korea  

6. **User Performance Gains by Data Offloading of LTE Mobile Traffic onto Unlicensed IEEE 802.11 Links**  
   Pavel Masek, Brno University of Technology, Czech Republic  
   Krystof Zeman, Brno University of Technology, Czech Republic  
   Jiri Hosek, Brno University of Technology, Czech Republic  
   Zdenek Tinka, Brno University of Technology, Czech Republic  
   Nermin Makhlouf, Brno University of Technology, Czech Republic  
   Ammar Muthanna, State University of Telecommunication, Russia  
   Norbert Herencsar, Brno University of Technology, Czech Republic  
   Vit Novotny, Brno University of Technology, Czech Republic  

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[http://tsp.vutbr.cz/]
1. Efficient Channel Quality Indicator Reporting Schemes in LTE with Reduced Signaling Overhead
   Muhammad Basit Shahab, University of South Asia, Pakistan

2. PSO-optimized Instant Overbooking Framework for Cognitive Radio Networks
   Zhaleh Sadreddini, Avrasya University, Turkey
   Erkan Guler, Giresun University, Turkey
   Tugrul Cavdar, Karadeniz Technical University, Turkey

3. Local Approach to Power Management in LTE Networks
   Mariusz Slabicki, Institute of Theoretical and Applied Informatics of the Polish Academy of Sciences, Poland
   Krzysztof Grochla, Institute of Theoretical and Applied Informatics of the Polish Academy of Sciences, Poland

4. Load Balancing Algorithms in Heterogeneous Networks for Intelligent Transportation Systems
   Zsolt Alfred Polgar, Technical University of Cluj-Napoca, Romania
   Andrei Ciprian Hosu, Technical University of Cluj-Napoca, Romania
   Zsuzsanna Ilona Kiss, Technical University of Cluj-Napoca, Romania
   Mihaly Varga, Technical University of Cluj-Napoca, Romania

5. Downlink Resource Scheduling Technique for Maximized Throughput with Improved Fairness and Reduced BLER in LTE
   Muhammad Basit Shahab, University of South Asia, Pakistan
   Muhammad Arif Wahla, University of South Asia, Pakistan
   Muhammad Tahir Mushtaq, University of Management and Technology, Pakistan

6. Design and Evaluation of an Antenna Array for MIMO Systems and Handset Wireless Applications
   Eduardo Rodriguez, University of Los Andes, Colombia
   Ezdeen Alghannai, Ohio State University, USA
   Roberto G. Rojas, Ohio State University, USA
   Roberto Bustamante, University of Los Andes, Colombia
1. **Estimation of the Anesthetic Depth based on Instantaneous Frequency of Electroencephalogram**  
   Amirreza Lashkari, Shiraz University, Iran  
   Reza Boostani, Shiraz University, Iran  
   Somayeh Afrasiabi, Shiraz University, Iran

2. **Four Channel Device for PPG Measurements**  
   Stefan Borík, University of Zilina, Slovakia  
   Ivo Cap, University of Zilina, Slovakia  
   Branko Babusiak, University of Zilina, Slovakia

3. **Estimation of Respiratory Rate from Photoplethysmogram Signal of Sleep Apnea Patients: A Comparative Study of Different Methods**  
   Setareh Dabiri, Shiraz University, Iran  
   Mohammad A. Masnadi Shirazi, Shiraz University, Iran

4. **Low Energy Wireless Communication for Medical Devices**  
   Branko Babusiak, University of Zilina, Slovakia  
   Stefan Borík, University of Zilina, Slovakia

5. **Presenting Efficient Features for Automatic CAP Detection in Sleep EEG Signals**  
   Foroozan Karimzadeh, Shiraz University, Iran  
   Esmaeil Seraj, Shiraz University, Iran  
   Reza Boostani, Shiraz University, Iran  
   Mohammad Torabi-Nami, Shiraz University of Medical Sciences, Iran

6. **Colorectal Cancer Recognition from Ultrasound Images, Using Complex Textural Microstructure Cooccurrence Matrices, Based on Laws’ Features**  
   Delia Mitrea, Technical University of Cluj-Napoca, Romania  
   Sergiu Nedevschi, Technical University of Cluj-Napoca, Romania  
   Mihail Abrudean, Technical University of Cluj-Napoca, Romania  
   Radu Badea, „Iuliu Hatieganu“ University of Medicine and Pharmacy Cluj-Napoca, Romania
1. **Computed Tomography Image Denoising by Learning to Separate Morphological Diversity**  
   Aryan Khodabandeh, Ryerson University, Canada  
   Javad Alirezaie, Ryerson University, Canada  
   Paul Babyn, University of Saskatoon Health Region, Royal University Hospital, Canada  
   Alireza Ahmadian, Tehran University of Medical Sciences, Iran

2. **Recognition of Face Orientation by Divided Hausdorff Distance**  
   JunYoung Kim, Chung-Ang University, Republic of Korea  
   Hyo-Rim Choi, Chung-Ang University, Republic of Korea  
   JaeHong Kwon, Chung-Ang University, Republic of Korea  
   TaeYong Kim, Chung-Ang University, Republic of Korea

3. **Ensuring Invariances for Structural Methods of Object Recognition**  
   Jiri Stastny, Brno University of Technology, Czech Republic  
   Vladislav Skorpil, Brno University of Technology, Czech Republic

4. **Water Quality Assessment by Image Processing**  
   Karel Horak, Brno University of Technology, Czech Republic  
   Jan Klecka, Brno University of Technology, Czech Republic  
   Miloslav Richter, Brno University of Technology, Czech Republic

5. **Compressive Sensing Based Image Reconstruction for Synthetic Aperture Radar Using Discrete Cosine Transform and Noiselets**  
   Tae Hee Kim, The Pennsylvania State University, USA  
   Ram Narayanan, The Pennsylvania State University, USA

6. **Preliminary Segmentation of Fetal Magnetocardiograms for a Wireless Diagnosis System**  
   Beatrice Arvinti, Politehnica University of Timisoara, Romania  
   Marius Costache, Politehnica University of Timisoara, Romania  
   Ronny Stolz, Institute for Photonic Technology (IPHT), Jena, Germany

7. **Automatic Evaluation of Polysomnographic Recordings in Matlab**  
   Eva Luptakova, University of Zilina, Slovakia  
   Dagmar Faktorova, University of Zilina, Slovakia
### TSP 2015

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<td>Friday, 10 July</td>
<td>18:00-18:15</td>
<td>Aquarius</td>
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<td>Closing Session</td>
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- **Friday, 10 July 2015**: 20:00-22:00 Hotel Restaurant

### Gala Dinner

**Notes:**
Guided walking tour through historical Prague

Meeting point

In front of the theatre Hybernia, yellow metro line B - station Namesti republiky

We'll show you all these sights

- Municipal House - one of the most beautiful Art Nouveau building
- Powder Gate - original city gate from 11 century
- House at the Black Madonna - black pearl of cubism
- Estate Theatre - only a few people know it is a part of National Theatre
- Carolinum - what has the biggest Czech left here
- Orloj, Old Town Square - centre of Prague with our famous Orloj
- Jewish Town - truth story without sanitization
- Charles Bridge - what makes the Bridge preserve for centuries?
- Island of artists - Kampa
- John Lennon’s Wall - every day different
- Lesser Town - centre of power
- Prague Castle - the largest castle complex in the world!
- Saint Vitus Cathedral and the real reason why was it actually built
Industrial Partners:

Honeywell

MICROSC

Smarter Wireless. Simply.

Technical Co-sponsors:

IEEE
Czechoslovakia Section

CZECHINVEST
Investment and Business Development Agency

Air Partner:

SKYTEAM
GLOBAL MEETINGS
Official Alliance Network