Conference Programme

17th – 20th September 2018
Ostrava, the Czech Republic
Local Organizing Organization
VSB – Technical University of Ostrava

www.vsb.cz

Organizing Team
Biomedical Engineering Research Group

http://bmeng.vsb.cz
Welcome Message
Dear conference attendees,

on behalf of the organizing committee, we would like to welcome you to the 20th International Conference on e-Health Networking, Application & Services - Healthcom2018 - held on 17th – 20th September 2018 in the city of Ostrava, the Czech Republic.

We are very glad to have the opportunity to take part in the organization of a conference that gathers researchers and professionals from academia and industry to share experiences and new ideas in such a dynamic area as eHealth technologies. As general chairs of this conference, it is our great honor to organize such a high-level conference for the first time in the Czech Republic.

IEEE Healthcom is the flagship conference of the IEEE Communications Society in the domain of eHealth. It is fully sponsored by the IEEE Comsoc and technically sponsored by the VSB - Technical University of Ostrava, Moravian - Silesian Region, The Czech Republic.

We aim to continue to develop an active research community in the domain of application of communication technologies to find out new solutions to improve health services and applications, offering safe, comfortable, inexpensive, and reliable solutions to support the increase in life expectancy. Information Technologies are the enabling technologies for telemedicine applications in remote and rural locations, but also for continuous health monitoring out of hospital, at home, and during sports, leisure or professional activities.

The topics of the conference are broadly covering the applications of IT in Medicine and Healthcare: Network/Communications Infrastructures and Architectures for Healthcare, Medical Imaging systems, connected biomedical sensors and physiological signal monitoring systems, Body sensor networks, Wearables and Medical IoT Interoperability and Intelligence, Medical data mining and decision systems for health and epidemiologic interventions, ICT-enabled personal health system, Connectivity for the Digital Citizen in an Immersive Environment, Security and privacy on eHealth…

But after two decades of intensive technical developments in these fields, some more fundamental questions arise now that the digitization of our health becomes an evidence. Mainly questions about privacy of our personal data. Also about the revolution of Healthcare delivery organization with major consequences for the activity of Health professionals. Moreover, the digital industry in health becomes a driving force for the whole IT industry. Healthcare is becoming one of the largest industries in most nations, with an increasing part of their GDP. Health IT will probably be recognized the main industrial activity of the 21st century. Growing opportunities for innovators in the areas of sensor technology the Internet of Things, Robotics, e-health, m-Health, Cloud Computing and emerging technologies such as 5G, Big Data, SDNs, NFV, Precision and Personalized Medicine. However, the integration of innovative technology into society is associated with social technological alignment and societal acceptance of technology which requires sound solutions with regards to ethical, legal, social and security challenges.

Healthcom first started in Sydney, Australia in 1999 under the impulsion of Prof. Pradeep Ray from New South Wales University. This year 2018, we are welcome in the city of Ostrava. First time in central Europe, the historical center of Europe.
Welcome Message

This year the conference IEEE Healthcom2018 is under the banner of “eHealth in Smart Regions”.

The Healthcom2018 conference offers an excellent program addressing the new frontiers of eHealth technologies and brings together experts from all over the world gathered in Ostrava to share their expertise and new ideas. We received contributions from 34 countries. A total of 220 papers were submitted to both the main conference and the workshops. We accepted 108 papers - the acceptation ratio is about 49 %. The program includes four keynote speeches, fifteen technical sessions covering 7 topics, two poster sessions, a demo session, one panel and four workshops. The conference also promotes a social program to offer participants the opportunity to visit the surprising city of Ostrava, its surroundings and explore Czech culture.

We would like to express our heartfelt gratitude to all the persons involved in the conference organization, the VSB - Technical university of Ostrava local organization, who have worked very hard for its success.

It is also our privilege to convey the community’s gratitude to the conference patrons, namely to the Moravian-Silesian Region Government, The Czech Telecommunication Office, Cesnet, Stapro, Gaben, the IEEE French section chapter EMBS and others, as well as to other sponsors and to the countless other volunteers who contributed in numerous ways to the success of the conference.

Sincerely,
Prof. Norbert Noury, University of Lyon, France
Assoc. Prof. Martin Černý, VSB-TU Ostrava, the Czech Republic
Organizing Committee

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Conference Proceedings

Conference proceedings is available only in electronic version.
You can download with link:
https://edas.info/showCD.php?c=24338&key=4691f9c3ea25bca82a97f075236a5daa
or in EDAS system.

The password is: Ostrava_proceedings@Healthcom2018

Approximately 30 days after conference will be proceedings submitted to IEEE XPLORE and Web of Science.
Keynote Speakers

Andreas Lymberis, Ph.D.

September 18, 9:30 – 10:15, Gong – conference hall

Andreas Lymberis is a physicist, post-graduated with a Ph.D. in biomedical engineering and sciences (1990, Paris, France). He worked for more than 20 years as researcher/engineer and R&D manager in biomedical technology and health telematics. In 1999 he joined the European Commission (Brussels, Belgium) as a scientific officer in eHealth where he initiated R&D activities on “smart wearable health systems and biomedical clothing”. Since 2004 he is senior research program officer first in microsystems and recently in electronic components and systems. In 2016 he has been appointed as head of sector “Wearables and Bioelectronics”. He is Senior IEEE Member and chaired the IEEE-EMBS Technical Committee on Wearable Biomedical Sensors and Systems (2004-2007). He published over 60 articles in journals, conference proceedings & books and he is editor of 2 books on wearable and mobile health systems.

ELECTRONIC SMART SYSTEMS AND HEALTH DIGITIZATION: A VIEW FROM EU RESEARCH & INNOVATION PROGRAMMES

Progress in technologies such as micro and nano electronics, smart systems, photonics etc is changing the way we design, produce, commercialise and generate value from products and related services. This is particularly true for health and care, entering in a deep transformation phase through digitization.

Professor Mounir Mohktari

September 19, 9:00 – 10:00, Gong – conference hall

Dr. Mounir Mokhtari received a PhD in Computer Science in the field of Human-Machine interaction in 1997 and a Research Habilitation in 2002 both from the University Pierre & Marie Curie in Paris. Mounir Mokhtari’s background is mainly in human-machine interaction in the domain of Ambient Assistive Living and semantic reasoning. Prof. Mokhtari, who has conducted several European and national projects, has supervised 13 Ph.D.s in this topic, direct supervision, where 10 have been successfully completed. He has over 200 publications in journals, books and conferences. Prof. Mounir Mokhtari was holding the Chair Quality of Life on Aging people 2011-2016, which was funded by a major health insurance companies in France Mutuelle Generale and AG2R - La Mondiale. Mounir Mokhtari is Principal Investigator in 2 European projects City4Age and PULSE under HORIZON 2020 Programme and is coordinating an industrial contract with PSA Peugeot-Citroen on smart mobility and wellbeing. Mounir Mokhtari is the founder of ICOST conference (International Conference On Smart homes and health Telematics), annual event moving regularly between Europe, Asia and North America. ICOST'2018 will be chaired by Mounir Mokhtari and hosted in Singapore, and will be co-located with World Cities Summit. Mounir Mokhtari received Palmes Academiques recognition from French Minister of Education and Research in 2015 “Chevalier des Palmes Académiques”.

SMART LIVING BASED IOT AND SEMANTIC REASONING FOR AGING WITH MILD DEMENTIA

Internet of thing (IoT) devices have radically transformed the daily lives of modern man ranging from monitoring one’s health and wellness to creating a “smart” living environment for optimal quality of life. We are interested in studying data generated from large number of IoT devices and using IoT readouts to accurately recapitulate the daily lives of man dwelling in an urban environment. Such information is extremely helpful in streamlining day to day processes and most importantly, to help reveal the patterns of human behavior for the design of a better environment for the population to dwell in. However, one of the key question in investigation is, how can we better define the type and architecture of IoTs required? Which are the unmet needs? It is thus of interest of research to define such IoT architecture, and corresponding user modeling, for better data analytics which is integral in enhancing the way we study human mobility. Our ambition is to design a real time service provisioning system for Ambient Assited Living focusing particularly on aging people with mild dementia.
SMART HOMES AND BEYOND: SMART ENVIRONMENTS FOR HEALTH

The ageing process is generally associated with a decline in the main bio-physiological capacities of individuals. This process is visible by a significant reduction in activities and of the social and family roles [Lelievre 2016]. Nevertheless, to have less activities does not come necessarily with less involvements in the one conserved [Clement 2005].

Due to the various costs of the placement in retirement houses - financial, psychological and social - people prefer to stay in their own home when they get aged. This is the place where they are familiar with, where they can develop or maintain their already existing network of relationships with relatives and peers. In addition, this is the place where they still can take, or participate to, decisions - on the internal organization, architecture and decoration. In short this is the place which enable people to maintain a beneficial “projection” in their future, a "project of life” at short and longer term.

Therefore, to face the increase span in longevity, the various stakeholders in the domain of gerontechnologies - researchers in various fields of public Health, ICT, industrial partners, business planners, policy makers - must actively envisage new ways to satisfy these needs for an independent living at home.

With aging, the elderly person will naturally reduce his activities. This corresponds to a normal physiological process due to the loss in musculo-skeletal strength and aptitudes. This may be a “normal” senescence with slow reduction in possible activities and their intensities. This can be more “pathological” if the subject reduces his activities fearing “accident-prone” situations, such as aggression or a fall; it has direct consequences with reduced socialization and increased isolation. Although in a most optimistic way, ageing can also be “optimal” if the subject accepts and adapts to his new evolving situation.

The main thesis in this presentation is that it is possible to promote this more optimistic way of aging with the use of information technologies as “enablers”. With the collection of various information directly in the environment of the subject, then the use of data fusion mechanisms to produce higher level information on the trends (trajectory) of Health, also with the elaboration of adapted feedbacks to motivate and accompany the person (coaching) ; This should also address the two other types of actors in home, that are the professionals and the informal carers.

After three decades of intensive technical developments in the field of smart homes, some more fundamental questions arise now that the digitization of our health becomes an evidence. Mainly questions about privacy of our personal data. Also about the revolution of Healthcare delivery organization with major consequences for the activity of Health professionals. Therefore, the introduction of technologies in the personal home, and in the professional activities, must be questioned in terms of acceptations to avoid the risk of rejection [Czaja 2006]. ICTs are prone to be intrusive, modifying the relationships and interactions to others and to places. Therefore we must select tools and metrics to measure the impact of the introduction of ICT in home.

The major source of information we can collect at home comes from the monitoring of the activities of the subject in terms of variety and intensity. Again we need some metrics. What do we need to measure and what do we do with the collected information?

We base our knowledge on the concept of homeostasis. This natural internal process regulates our physiological parameters in order to face external variations (e.g. thermoregulation of internal central temperature, adaptation of cardiac frequency to efforts, regulation of arterial pressure, regulation of blood concentrations in oxygen and carbon dioxide, etc.). It was evidenced by the French Physiologist Claude Bernard in 1865, that the adaptation of homeostasis is an expression of good health as it shows how the human system dynamically adapts to face pathological aggressions.

In the French project AILISA we started with the development of a basic sensing technology, based on a network of sensors to measure selected physiological parameters, parameters on ambient conditions and in addition parameters of activities. We proposed the representation named “ambulatograms” [Noury 2000] to visualize the daily mobility and we first uncovered the “circadian rhythms of activities” [Virone 2002] [Le Bellego 2006]. We found that the technology we placed at home was not rejected by people because it brought
sense. But also that the technology should not be too demanding to the end user; the physiological devices were rapidly neglected because they needed too much interactions from users.

In the project MAPA, promoted by the French operator Orange Labs, we adopted a less intrusive approach using a technology already in place. A simple meter of the electrical energy was adapted in order to produce indicators of the class of activities performed. We discovered that with this very unobtrusive technology we could detect some pathological trends of activities [Noury 2011]. This was also a confirmation that the main information collected are not on the absolute values (static) but in their variations (dynamic).

The domain of Health Smart homes is not new as it started to develop in the mid-90s. But we statement its deployment is very limited. Was it a failure in acception, in motivation, or we did not access the right levers (politics, industrial, business makers)? So it is worth questioning on the means for introducing technologies in the home. Thus, in our discussion we will attempt to bring some elements of responses, but modestly no solution will be proposed.

As a conclusion we aim to consider the introduction of Health Smart Homes technologies not only as a problem to be solved in itself, but furthermore as a broader paradigm of the more and more complex problems humans will have to solve in the near future, mixing different scientific points of views - science, technology, usages, ergonomics, and sociology. From the ergonomic point of view we must be more prospective. What we learn is that we need to work together, to share our knowledges, to expand our own understanding, to be more integrative, also more flexibles and modest.

Professor Norbert Noury, Senior Member IEEE

References
Miroslav Voznak, Professor at VŠB - Technical university of Ostrava, received the PhD. degree in telecommunications from the Faculty of Electrical Engineering and Computer Science, VSB-Technical University of Ostrava and completed his habilitation in 2002 and 2009, respectively. He was appointed Full Professor in 2017 in Electronics and Communication technologies. He is an IEEE senior member and he has served as a member of editorial boards for several journals, such as the Journal of Communications or as a guest editor for Wireless Personal Communications. His research interests focus generally on information and communications technology, particularly on the quality of service and experience, network security, wireless networks and in the last couple years also on big data analytics.

QUALITY OF EXPERIENCE IN MULTIMEDIA SYSTEMS
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<td>S4-1: eHealth for aging</td>
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<td>S4-2: IMAGE PROCESSING</td>
<td>S4-3: SIGNAL/DATA PROCESSING AND SYSTEMS 4</td>
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<td>W3: WORKSHOP DECISION SUPPORT SYSTEMS FOR ONCOLOGY</td>
<td>Visit of Dolni Vitkovice area (group1)</td>
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<td>Visit of Dolni Vitkovice area (group2)</td>
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<td>10:00-12:00</td>
<td>S5-1: COMMUNICATIONS AND NETWORKING</td>
<td>S5-2: MEDICAL, BIOMEDICAL AND HEALTH INFORMATICS 3</td>
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<td>S5-3: DEVICES 4</td>
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Detailed Programme

You can download a detailed programme at conference web pages too.

**Link:** [http://healthcom2018.ieee-healthcom.org/program](http://healthcom2018.ieee-healthcom.org/program)

Please upload your presentation before your section in your room of presentation

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**Sunday, September 16**

**8:00 - 18:00**

**Registration**

- Preliminary reservation requested
- **Place: Hotel Garni VSB - TU Ostrava, Hotel Imperial**

  Registration only for attendees accommodated in recommended hotels - Hotel Imperial and Hotel Garni VSB TU Ostrava. On request. Please fill out your hotel in attendee questionnaire or let us know by email.
  
  Sunday, September 16 9:00 - 17:00

**SE1: Visit of NATO Days**

- Preliminary reservation requested
- **Place: NATO days**

  Free of charge. Event includes entrance to NATO days and free transport from recommended conference hotels in specified times. Fully sponsored by Moravian Silesian Regional Government.
  
  Register for the event by filling out the attendee questionnaire or by email.
Monday, September 17

8:30 - 18:00

Registration

Place: Hotel Garni VSB - TU Ostrava, Hotel Imperial, VSB - TU Campus AULA, Rector’s Lounge (room No. NA178)

Registration desk will be in building AULA of VSB - Technical University, room Rector’s Lounge

Or you can register directly at your hotel during hotel check in. Please fill out your hotel in attendee questionnaire or let us know by email.

10:00 - 10:15

W-BR1: Coffee break - Workshop

Place: VSB - TU Campus – AULA, Rector’s Lounge (room No. NA178)

Coffee break will be held in VSB - TU Ostrava Campus in Ostrava Poruba. Meeting point is building Aula, room Rector’s Lounge.

10:15 - 11:45

W1: IOT-HEALTH 2018 and ETPHA 2018 Workshops

Place: Tramway

Chairs: Ashraf A Ali (University of South Wales, United Kingdom (Great Britain)), Lukas Peter (VSB-Technical University of Ostrava, Czech Republic)

Meeting point is building Aula, room Rector’s Lounge 15 minutes before session! The closest tramway stop is "Hlavni trida" GPS: 49°49'51.8"N 18°09'48.8"E https://goo.gl/maps/PU4Wv6vXDGq

List of presentations:

VITASENIOR-MT: a telehealth solution for the elderly focused on the interaction with TV
Gabriel Pires (Instituto Politécnico de Tomar & Instituto de Sistemas e Robótica - Coimbra, Portugal); Pedro Correia, Dário Jorge, Diogo Santos, Nelson Gomes, Pedro Dias, Pedro Ferreira, Ana Lopes, António Manso and Luís Almeida (Instituto Politécnico de Tomar, Portugal); Luís Oliveira (IT, UBI and Polytechnic Institute of Ostrava, Czech Republic); Renato Panda (Instituto Politécnico de Tomar, Portugal); Paulo Monteiro (Softinsa - Centro de Inovação Tecnológica de Tomar, Portugal); Carla Grácio (Comunidade Intermunicipal do Médio Tejo, Portugal); Telmo Pereira (ESTSC - Instituto Politécnico de Coimbra, Portugal)

Investigation on Dielectric Properties of Glucose Aqueous Solutions at 500 KHz-5MHz for Noninvasive Blood Glucose Monitoring
Ning Zeng (Shantou University, P.R. China); Jingzhen Li, Tobore Igbe and Yuhang Liu (Shenzhen Institutes of Advanced Technology Chinese Academy of Sciences, P.R. China); Yan Cui (Shantou University, P.R. China); Ze-dong Nie (Shenzhen Institutes of Advanced Technology Chinese Academy of Sciences, P.R. China)

Performance Evaluation and Benchmarking of Mission Critical Medical Access Systems
Ashraf A Ali (University of South Wales, United Kingdom (Great Britain)); Fatimah Alzahrany (University of south weals, United Kingdom (Great Britain)); Andrew Ware (University of South Wales, United Kingdom (Great Britain)); Khalid Al-Begain (University of South Wales & Glamex Security Ltd, United Kingdom (Great Britain))

MARCIA: Applied Clinical Record Management
Fabio Gomes, João José Filho and Arthur Bezerra (Federal Institute Of Ceara, Brazil); César de Moura, Filho (IFCE, Brazil); Antonio Oliveira (Federal Institute Of Ceara, Brazil); Luiz Odorico Andrade (UFC, Brazil)
11:45 - 12:45

W-L1: Lunch - Workshops

Place: VSB - TU Campus AULA, room Rector’s Lounge (room No. NA178)

Lunch will be held in VSB - TU Ostrava Campus in Ostrava Poruba at the building Aula, room Rector’s Lounge.

13:00 - 17:00

W2: THE 1ST INTERNATIONAL WORKSHOP ON QUALITY OF SERVICE IN EHEALTHCARE

Place: Tramway

Chairs: Petr Koudelka (Czech Telecommunication Office & Data Service Inspection Unit, Czech Republic), Radek Martinek (VSB - Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic)

Meeting point is building Aula 15 minutes before session! The closest tramway stop is ”Hlavni trida” GPS: 49°49'51.8"N 18°09'48.8"E. https://goo.gl/maps/PU4Wv6vXDq Coffee break for this session will be served directly in Tramway

List of presentations :

1. 2. Real-time Patient Localization in Urgent Care: System Design and Hardware Perspective
Jaromir Konecny (VSB - Technical University of Ostrava, Czech Republic); Michal Prauzeck (VSB - Technical University of Ostrava, Czech Republic); Libor Michalek and Martin Tomis (VSB - Technical University of Ostrava, Czech Republic); Radek Martinek (VSB - Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic)

3. Adaptive Linear Neuron for Fetal Electrocardiogram Extraction
Radana Kahankova (VSB - Technical University of Ostrava, Czech Republic); Radek Martinek (VSB - Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic); Martina Mikolasova and Rene Jaros (Technical University of Ostrava, Czech Republic)

4. Use of a FIR filter for fetal phonocardiography processing
Rene Jaros (Technical University of Ostrava, Czech Republic); Radek Martinek (VSB - Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic); Radana Kahankova and Marcel Fajkus (VSB - Technical University of Ostrava, Czech Republic); Jan Nedoma (VSB-TUO, Czech Republic)

5. Monitoring of environmental variables in rooms of the Department of Cybernetics and Biomedical Engineering
Jan Velicka and Martin Pies (VSB - Technical University of Ostrava, Czech Republic); Radovan Hajovsky (VSB-TUO, Czech Republic)

6. The Impact of Network Capacity on Quality of Communication Infrastructure for eHealth
Petr Koudelka (Czech Telecommunication Office & Data Service Inspection Unit, Czech Republic); Karel Tomala, Petr Henerka and Jan Yavrecka (Czech Telecommunication Office, Czech Republic); Radek Martinek (VSB - Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic)

7. SMART medical polydimethylsiloxane for monitoring vital signs of the human body
Jan Nedoma (VSB-TUO, Czech Republic); Marcel Fajkus (VSB - Technical University of Ostrava, Czech Republic); Jakub Cubik (VSB-TUO, Czech Republic); Stanislav Kepak (VSB-Technical University of Ostrava, Czech Republic); Radek Martinek (VSB - Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic); Jan Vanus (VSB - Technical University of Ostrava, Czech Republic); Rene Jaros (Technical University of Ostrava, Czech Republic)

8. CardiaQloud: A Remote ECG Monitoring System Using Cloud Services for eHealth and mHealth Applications
Ismael Villanueva-Miranda (University of Texas at El Paso, USA); H Nazeran (University of Texas, USA); Radek Martinek (VSB - Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic)
9. A Semantic Interoperability Approach to Heterogeneous Internet of Medical Things (IoMT) Platforms
Ismael Villanueva-Miranda (University of Texas at El Paso, USA); H Nazeran (University of Texas, USA); Radek Martinek (VSB - Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic)

10. A Robust PPG-based Heart Rate Monitor for Fitness and eHealth Applications
Maryamsadat Shokrekhodaei and Stella Quinones (University of Texas at El Paso, USA); Radek Martinek (VSB - Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic); Homer Nazeran (University of Texas at El Paso, USA)

11. Using the PI ProcessBook software tool to monitor room occupancy in Smart Home Care
Jan Vanus (VSB - Technical University of Ostrava, Czech Republic); Radek Martinek (VSB - Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic); Jan Nedoma (VSB-TUO, Czech Republic); Marcel Fajkus (VSB - Technical University of Ostrava, Czech Republic); Jan Kubicek (VSB-Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic); Marek Penhaker (VSB - Technical University of Ostrava, Czech Republic)

12. An Interferometric Sensor for Monitoring Respiratory and Heart Rate of the Human Body
Jan Nedoma (VSB-TUO, Czech Republic); Marcel Fajkus (VSB - Technical University of Ostrava, Czech Republic); Stanislav Kepak (VSB-Technical University of Ostrava, Czech Republic); Jakub Cubik (VSB-TUO, Czech Republic); Stanislav Žabka (VSB–Technical University of Ostrava, Czech Republic); Radek Martinek (VSB - Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic); Vlastimil Slany and Jan Marecek (Mendel University in Brno, Czech Republic)

13. Design of hybrid EPON network with fiber-optic breath sensors
Jakub Cubik (VSB-TUO, Czech Republic); Stanislav Kepak (VSB-Technical University of Ostrava, Czech Republic); Marcel Fajkus (VSB - Technical University of Ostrava, Czech Republic); Jan Nedoma and Zdenek Wilcek (VSB-TUO, Czech Republic); Vladimir Vasinek (Technical University of Ostrava, Czech Republic)

14. Examination and Optimization of the Fetal Heart Rate Monitor
Jakub Kolarik (VSB-TU Ostrava, Czech Republic); Lukas Soustek (VSB - Technical University of Ostrava, Czech Republic); Radek Martinek (VSB - Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic)

15. Comparison of fetal phonocardiography de-noising by wavelet transform and the FIR filter
Rene Jaros (Technical University of Ostrava, Czech Republic); Radek Martinek (VSB - Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic); Radana Kahankova, Jan Vanus and Marcel Fajkus (VSB - Technical University of Ostrava, Czech Republic); Jan Nedoma (VSB-TUO, Czech Republic)
Tuesday, September 18

8:00 - 19:00

Registration

Place: Gong – Lobby

9:00 - 9:30

Opening ceremony

Place: Gong - Conference hall

Chairs: Martin Cerny (VSB - Technical University of Ostrava, Czech Republic), Norbert Noury (University of Lyon & Team Biomedical Sensors, France)

Welcome speech by Dean of Faculty of Electrical Engineering and Computer Science of VSB - Technical university of Ostrava - prof. Pavel Brandstetter

President of Moravian Silesian region - prof. Ivo Vondrak

9:30 - 10:15

K1: Keynote lecture - Andreas Lymberis, Ph.D.

Place: Gong - Conference hall

Chair: Norbert Noury (University of Lyon & Team Biomedical Sensors, France)

10:15 - 10:30

Conference group photo

Place: Gong building entrance

10:30 – 11:00

BR1: Coffee Break

Place: Gong - Food Court

11:00 - 12:20

S1-1: DEVICES 1

Place: Gong - Conference hall

Chairs: Nazim Agoulmine (University of Evry Val d’Essonne, USA), Henryk Josiński (Polish-Japanese Academy of Information Technology & Silesian University of Technology, Poland)

List of presentation:

A non-intrusive system for seated posture identification
Daniele Bibbo and Federica Battisti (Università degli Studi Roma Tre, Italy); Silvia Conforto (University Roma Tre, Italy); Marco Carli (Università degli Studi Roma TRE, Italy)

Strain gauges position optimization in designing custom load cells for sport gesture analysis
Daniele Bibbo (Università degli Studi Roma Tre, Italy); Stefano Gabriele (University “Roma Tre” of Rome, Italy); Andrea Scorza (Roma TRE University, Italy); Maurizio Schmid (Roma Tre University, Italy); Salvatore Andrea Sciuto (University of ROMA TRE, Italy); Silvia Conforto (University Roma Tre, Italy)

Considerations for the Design of an Activity Recognition System Using Inertial Sensors
Athanasios I. Kyritsis, Michel Deriaz and Dimitri Konstantas (University of Geneva, Switzerland)
Body Movement Monitoring for Parkinson's Disease Patients Using A Smart Sensor Based Non-Invasive Technique
Sara Soltaninejad, Andres Rosales Castellanos and Fang Ba (University of Alberta, Canada); Mario Alberto Ibarra-Manzano (Universidad de Guanajuato & División de Ingenierías, Mexico); Irene Cheng (University of Alberta, Canada)

S1-2: SIGNAL/DATA PROCESSING AND SYSTEMS 1
Place: Gong - Room 4
Chairs: Giulia Cisotto (University of Padova, Italy), D Santhosh Reddy (Academic Block A, WiNet Lab, Kandi, Sangareddy & IIT-Hyderabad, India)

List of presentation:

Non-invasive determination of the arterial compliance by cardiovascular bioimpedance signal processing
Ridha Ben Salah (Prince Sattam Bin Abdulaziz University & College of Applied Medical Sciences, Saudi Arabia); Tareq Alhadidi (Prince Sattam bin Abdulaziz University & Biomedical Technology Dep., Saudi Arabia); Ihsen Ben Salah (National Engineering School of Carthage, Tunisia); Kaïs Ouni (ENICarthage, Tunis & National Engineering School of Carthage, Tunisia)

Similarity Recognition of Interval-Based Sleep Data
Marc Haßler, Andreas Burgdorf, Christian Kohlschein and Tobias Meisen (RWTH Aachen University, Germany)

A Bispectrum-based Approach for Detecting Deception using EEG Signals
Rami Alazrai, Faisal Alqasem and Saqr Alaarag (German Jordanian University, Jordan); Khalil M. Ahmad Yousef (Hashemite University, Jordan); Mohammad I. Daoud (German Jordanian University, Jordan)

Beats-Per-Minute (BPM): A Microservice-based Platform for the Monitoring of Health Related Data via Activity Trackers
Orla O'Brien (Cork Institute of Technology & Dell, Ireland); Ruairi D O'Reilly (Cork Institute of Technology, Ireland)

S1-3: MEDICAL, BIOMEDICAL AND HEALTH INFORMATICS 1
Place: Gong - Room 5
Chairs: Marek Penhaker (VSB - Technical University of Ostrava, Czech Republic), Jonas Wahslen (KTH, Sweden)

List of presentation:

Authentication and Usability in mHealth Apps
Zhongwei Teng, Peng Zhang, Xiao Li, William Nock and Marcelino Rodriguez-Cancio (Vanderbilt University, USA); Denis Gilmore (Vanderbilt University Medical Center, USA); Jules White and Douglas C. Schmidt (Vanderbilt University, USA); Jonathan Nesbitt (Vanderbilt University Medical Center, USA)

Blockchain Utilization in Healthcare: Key Requirements and Challenges
Tanesh Kumar (University of Oulu, Finland); Vidhya Ramaani (Centre for Wireless Communication, University of Oulu, Finland); Ijaz Ahmad (University of Oulu, Finland); An Braeken (Vrije Universiteit Brussel, Belgium); Erkki Harjula (University of Oulu, Finland); Mika E Ylianttila (University of Oulu & Centre for Wireless Communications, Finland)

Blockchain-based Personal Health Data Sharing System Using Cloud Storage
Xiaochen Zheng (Universidad Politécnica de Madrid, Spain); Raghava Rao Mukkamala and Ravi Vatrapu (Copenhagen Business School, Denmark); Joaquin Ordieres-Meré (Technical University of Madrid, Spain)

A Blockchain-based Architecture Framework for Secure Sharing of Personal Health Data
Sandro Amofa, Emmanuel Bouateng Sifeh and Kwame Opani-Boachie Obour Agyekum (University of Electronic Science and Technology of China, P.R. China); Abra Smahi (School of Computer Science and Engineering, UESTC, Chengdu, P.R. China); Qi Xia (University of Electronic Science and Technology of China, P.R. China); James C Gee (University of Pennsylvania, USA); Jianbin Gao (School of Resources and Environment University of Electronic Science and Technology of China, P.R. China)
Detailed Programme: Tuesday, September 18

12:20 - 13:20

**L1: Lunch**

Place: Gong - Food Court

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13:20 - 14:40

**S2-1: DEVICES 2**

Place: Gong - Conference hall

Chairs: **Lubomír Štěpánek** (Faculty of Biomedical Engineering, Czech Technical University in Prague, Czech Republic), **Agnieszka Szczęsna** (Silesian University of Technology, Poland)

List of presentation:

- **Human Body Energy Harvesting Solutions for Wearable Technologies**
  Antonino Proto (VSB - Technical University of Ostrava, Czech Republic); Daniele Bibbo (Università degli Studi Roma Tre, Italy); Martin Cerny (VSB - Technical University of Ostrava, Czech Republic); Lukas Peter (VSB-Technical University of Ostrava, Czech Republic); Silvia Conforto (University Roma Tre, Italy); Maurizio Schmid (Roma Tre University, Italy); Marek Penhaker (VSB - Technical University of Ostrava, Czech Republic)

- **HEAL: A Health Analytics Intelligent Agent Platform for the acquisition and analysis of physiological signals**
  Arindam Ghosh (Oviva AG, Germany & University of Trento, Italy); Evgeny Stepanov, Juan Mayor Torres, Morena Danieli and Giuseppe Riccardi (University of Trento, Italy)

- **Smart telemetry kit for proactive health monitoring in rural India: The journey so far and the road ahead**
  Sudheer Babu (Analog Devices, India); Abhinay Vishwanatham (Sri Sathyai Sai Institute of Higher Learning, India); Amar Sainath Reddy Tamanampudi (Sri Sathyai Sai Institute Of Higher Learning, India); Boopala Krishnan (Sri Sathyai Sai Institute of Higher Learning & Deemed University, India); Sai Prem Shaji and Siva Sankara Sai Sanagapati (Sri Sathyai Sai Institute of Higher Learning, India); Jai Ganesh Udayasankaran (Sri Sathyai Sai Central Trust & Member, Governing Committee, Asia eHealth Information Network (AeHIN), India); Prasana Raja (SmartX Connected Products, Chennai, India)

- **Evaluation of Movement Deficiencies in Patients with Vestibular Disorders using Motion Analysis**
  Jaroslav Majerník (Pavol Jozef Safarik University in Kosice, Slovakia)

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**S2-2: SIGNAL/DATA PROCESSING AND SYSTEMS 2**

Place: Gong - Room 4

Chairs: **Jan Havlík** (Czech Technical University in Prague, Czech Republic), **Ruairí D O'Reilly** (Cork Institute of Technology, Ireland)

List of presentation:

- **Deep Learning Based Automated Extraction of Intra-Retinal Layers for Analyzing Retinal Abnormalities**
  Taimur Hassan (National University of Sciences and Technology, Pakistan); Anam Usman (CASE, Pakistan); Muhammad Usman Akram (CEME NUST, Pakistan); Fasgian Massood (Center for Advanced Studies in Engineering, Pakistan); Ubaid Yasin (Armed Forces Institute of Ophthalmology, Pakistan)

- **Extraction and Analysis of RPE layer from OCT Images for Detection of Age Related Macular Degeneration**
  Muhammad Majid Sharif (National University of Sciences and Technology, Pakistan); Muhammad Usman Akram (CEME NUST, Pakistan); Asad Waqar Malik (National University of Science and Technology (NUST), Pakistan)

- **Classification of Nonalcoholic Fatty Liver Texture Using Convolution Neural Networks**
  D Santhosh Reddy (Academic Block A, WiNet Lab, Kandi, Sangareddy & IIT-Hyderabad, India); Ramkrishna Bharath (Indian Institute of Technology, India); P Rajalakshmi (Indian Institute of Technology Hyderabad, India)
Detailed Programme: Tuesday, September 18

A Novel Computer-Aided Diagnosis Framework Using Deep Learning for Classification of Fatty Liver Disease in Ultrasound Imaging
D Santhosh Reddy (Academic Block A, WiNet Lab, Kandi, Sangareddy & IIT-Hyderabad, India); Ramkrishna Bharath (Indian Institute of Technology, India); P Rajalakshmi (Indian Institute of Technology Hyderabad, India)

S2-3: MEDICAL, BIOMEDICAL AND HEALTH INFORMATICS 2

Place: Gong - Room 5

Chairs: Alberto Huertas Celdrán (University of Murcia, Spain), Ellen Jaatun (NTNU & St Olav University Hospital, Norway)

List of presentation:

'We must ignore ePrescription': An empirical analysis of Czech physicians' attitudes against eHealth
Michal Dolezel (University of Economics, Czech Republic)

Clustering Inter-Arrival Time of Health Care Encounters for High Utilizers
Chengliang Yang, Chris Delcher, Elizabeth Shenkman and Sanjay Ranka (University of Florida, USA)

Simplifying biomedical data sharing through a web portal generator
André Malha (Universidade de Aveiro, Portugal); José Luis Oliveira (University of Aveiro, Portugal)

Brokering Services for Integrating Health Cloud Platforms for Remote Patient Monitoring
Raafat Abarukba, Assim Sagahyroon, Fadi Aloul and Niha Thodika (American University of Sharjah, United Arab Emirates)

14:40 - 15:00

BR2: Coffee break
Place: Gong - Food Court

15:00 - 16:40

S3-1: DEVICES 3

Place: Gong - Conference hall

Chairs: Athanasios I. Kyritsis (University of Geneva, Switzerland), Marek Penhaker (VSB - Technical University of Ostrava, Czech Republic)

List of presentation:

Analysis of Chaotic Behaviors in Gait of the Elderly using the CAREN Extended system
Henryk Josiński (Polish-Japanese Academy of Information Technology, Poland); Adam Śwońoński (Silesian University of Technology, Poland); Piotr Grabiec (Polish-Japanese Academy of Information Technology, Poland); Agnieszka Michalczuk (Silesian University of Technology, Poland); Magdalena Pawłyta and Konrad Wójciechowski (Polish-Japanese Academy of Information Technology, Poland)

Assessment of Gait Parameters in Virtual Environment
Agnieszka Szczęsna (Silesian University of Technology, Poland); Monika Błaszczyszyn (Opole University of Technology, Poland); Magdalena Pawłyta (Polish-Japanese Academy of Information Technology, Poland); Agnieszka Michalczuk (Silesian University of Technology, Poland)

Multipurpose Sensor for Human Movement Analysis
Jan Foltyn and Radek Halfar (VSB - Technical University of Ostrava, Czech Republic); Martin Cerny (VSB - Technical University of Ostrava, Czech Republic); Norbert Noury (University of Lyon & Team Biomedical Sensors, France)

Evaluation of wearable Kinematic Algorithms for the Monitoring of Ecological Activity
Norbert Noury (University of Lyon & Team Biomedical Sensors, France); Bruno Perriot (University of Lyon & Sleepinnov Technology, France)

Automated Gait Analysis using a Kinect Camera and Wavelets
Beatriz Munoz (Valle del Lili Clinical, Colombia); Yor J Castaño, Juan David Arango Paredes and Andres Navarro (Universidad Icesi, Colombia)
S3-2: SIGNAL/DATA PROCESSING AND SYSTEMS 3

Place: Gong - Room 4

Chairs: Ondřej Klempír (Faculty of Biomedical Engineering, Czech Technical University in Prague, Czech Republic), Lukáš Peter (VSB-Technical University of Ostrava, Czech Republic)

List of presentation:

A Convolutional Neural Network for Smoking Activity Recognition
Fayez Alharbi (Goldsmiths, University of London, United Kingdom (Great Britain)); Katayoun Farrahi (Lecturer & University of Southampton, United Kingdom (Great Britain))

Toward an Embedded OFDM-based System for Living Cells Study by Electrochemical Impedance Spectroscopy
Edwin De Roux (University of Cergy Pontoise & ENSEA, France); Mehdi Terosiét and Florian Kolbl (ETIS, France); Michel Boissiere and Emmanuel Pauthe (ERRMECE, France); Aymeric Histace (ETIS UMR CNRS 8051 & University of Cergy-Pontoise, ENSEA, France); Olivier Romain (ETIS, France)

Physiological Waveform Imputation of Missing Data using Convolutional Autoencoders
Daniel Miller, Andrew Ward, Nicholas Bambos and David Scheinker (Stanford University, USA); Andrew Shin (Stanford University School of Medicine, USA)

Classification of grasping tasks based on EEG-EMG coherence
Giulia Cisotto and Anna Guglielmi (University of Padova, Italy); Leonardo Badia (Università degli Studi di Padova, Italy); Andrea Zanella (University of Padova, Italy)

A Novel Classification Framework for EEG Based Four Class Motor Imagery Using Kullback-Leibler Regularized Riemannian Manifold
Pradeep Mishra, Jagadish, B. M. P. R. S. Kiran and P Rajalakshmi (Indian Institute of Technology Hyderabad, India); D Santhosh Reddy (Academic Block A, WiNet Lab, Kandi, Sangareddy & IIT-Hyderabad, India)

ICE++: Improving Security, QoS, and High Availability of Medical Cyber-Physical Systems through Mobile Edge Computing
Alberto Huertas Celdrán and Felix J. Garcia Clemente (University of Murcia, Spain); James Weimer and Insup Lee (University of Pennsylvania, USA)

S3-3: Practical Applications of e-Health

Gong - Room 5

Chairs: Adelina Basholli (University of Sheffield- South East European Research Centre, United Kingdom (Great Britain)), Stefan Lentelink (Roessingh Research and Development, The Netherlands)

List of presentation:

Research on an information sharing system using COI specialized for urgency in the home care field
Hiroshi Yajima (Tokyo Denki University, Japan); Yuya Totsuka (Tokyo Denki University, Japan)

Cooperative Note-Taking in Psychotherapy Sessions: An Evaluation of the Therapist's User Experience with Tele-Board MED
Anja Perlich (Hasso-Plattner-Institut, Universität Potsdam, Germany); Christoph Meinel (Hasso Plattner Institute, University of Potsdam, Germany)

Automated Diagnosis of Clinic Workflows
Alex Cheng and Jules White (Vanderbilt University, USA)

MineBike: Exergaming with Minecraft
Yunho Huh and Gregory Duarte (University of California, Irvine, USA); Magda El Zarki (University of California at Irvine, USA)

Measuring inconsistent diagnoses
Diana Costa and Manuel Martins (University of Aveiro, Portugal)
Detailed Programme: Tuesday, September 18

16:00 – 17:30

Public discussion with keynote speakers
Place: Gong – Entrance area - basement
Panel discussion with keynote speakers and representatives of Moravian Silesian Region. Entrance free.

17:00 - 18:00

Welcome drink
Place: Hlubina Brickhouse – 1st floor
Welcome drink
…. Czechs like beer – “Na zdraví!” (translation: Cheers!)
(Non-alcoholic beer will be served too.)

18:00 - 19:00

Concert
Place: Hlubina Brickhouse – 2nd floor
Concert of the 40 players university Orchestra (Orchestra of VSB - TU Ostrava). They will present music from famous musicals, movies and pop music authors.
Event is fully sponsored by VSB - Technical university of Ostrava, free entrance. English guides

19:00 - 24:00

Welcome reception
Place: Hlubina Brickhouse
“Beer, what else?”
Part of the evening will be a "beer tapping school", where each participant can try to tap his own beer with help of one the winners of the professional beer tapping competition - "Pilsner Urquell Master Bartender".
Non – alcoholic beer will be served too.
All dishes served during this evening will be made from ingredients from local suppliers.
The evening cultural activities are sponsored by VŠB - TU Ostrava and other sponsors.
### Wednesday, September 19

#### 8:30 - 15:00

**Registration**  
Place: Gong - Lobby

#### 9:00 - 10:00

**K2: Keynote lecture - prof. Mounir Mohktari**  
Place: Gong - Conference hall  
Chair: Norbert Noury (University of Lyon & Team Biomedical Sensors, France)

#### 10:00 - 10:30

**BR3: Coffee break**  
Place: Gong - Food Court

#### 10:30 - 12:30

**S4-1: eHealth for aging**  
Place: Gong - Conference hall  
Chairs: Martin Cerny (VSB - Technical University of Ostrava, Czech Republic), Anja Perlich (Hasso-Plattner-Institut, Universität Potsdam, Germany)

**List of presentation:**

- A Health Monitoring Application to Support Informal Caregivers of People with Cognitive Impairment  
  Stefan Lentelink, Mariët Dekker, Mirka Evers, Boris van Schooten, Hermie Hermens and Monique Tabak (Roessingh Research and Development, The Netherlands)

- Hardware / Software Architecture for Services in the Hearing Aid Industry  
  Benjamin Cauchi and Marco Eichelberg (OFFIS-Institut für Informatik, Germany); Andreas Huewel and Kamil Adiloğlu (HörTech gGmbH, Germany); Hartmut Richter and Marei Typlt (Audifon GmbH & Co, Germany)

- Anomaly Detection Techniques in Mobile App Usage Data among Older Adults  
  Athanasios I. Kyritsis, Michel Deriaz and Dimitri Konstantas (University of Geneva, Switzerland)

- Meeting challenges of activity recognition for ageing population in real life settings  
  Aimilia Papaquiannaki, Evangelia I Zacharaki and Konstantinos Deltouzos (University of Patras, Greece); Roberto Orselli (Smartex s. r. l, Italy); Anne Freminet (University Hospital of Nancy, France); Sibora Cela (University Hospital of Patras, Greece); Elena Aristodemou and Marina Polycarpou (Care and Rehabilitation Unit MATERIA, Cyprus); Marina Kotsani (University Hospital of Nancy, France); Athanase Benetos (University Hospital of Nancy, Greece); John Ellul (University Hospital of Patras, Greece); Vassilis Megalooikonomou (University of Patras, Greece)

- A Proposal for Monitoring People of Health Risk Group Using IoT Technologies  
  Mauricio Neto (Federal University of Ceara, Brazil); Emanuel Coutinho (UFU, Brazil); Leonardo Moreira (Federal University of Ceara, Brazil); Jose N de Souza (UFU, Brazil); Nazim Agoulmine (University of Evry Val d'Essonne, USA)

- Healthcare professionals' attitudes towards remote patient monitoring through sensor networks  
  Adelina Basholli (SEERC, Thessaloniki, Greece); Thomas Lagkas (The University of Sheffield International Faculty, Greece); Peter Bath (University of Sheffield, United Kingdom (Great Britain)); George Eleftherakis (CITY College, Greece)

#### S4-2: IMAGE PROCESSING 1  
Place: Gong - Room 4  
Chairs: Jan Kubicek (VSB-Technical University of Ostrava & Faculty of Electrical Engineering and Computer Science, Czech Republic), Antonino Proto (VSB - Technical University of Ostrava, Czech Republic)
List of presentation:

**Health Risk Prediction Using Big Medical Data - a Collaborative Filtering-Enhanced Deep Learning Approach**
Xin Li and Juan Li (North Dakota State University, USA)

**Personalized Effect of Health Behavior on Blood Pressure: Machine Learning Based Prediction and Recommendation**
Po-Han Chiang and Sujit Dey (University of California, San Diego, USA)

**Noninvasive aspiration detection using through-transmission ultrasound**
Yosuke Hara and Yukio Katori (Tohoku University, Japan); Shigeaki Okamura and Hirofumi Taki (Kyoto University, Japan); Hiroki Umeda (Tohoku Institute of Technology, Japan); Tatsuya Uechi, Fumihiko Kawamura, Yoichi Haga, Ryoichi Nagatomi and Shin-ichi Izumi (Tohoku University, Japan)

**Learning Based Segmentation of Skin Lesion from Dermoscopic Images**
Muhammad Ammar (NUST College of EME, Pakistan); Sajid Gul Khawaja (National University of Sciences and Technology (NUST), Pakistan); Abeera Atif (National University of Sciences and Technology, Pakistan); Muhammad Usman Akram (CEME NUST, Pakistan); Muntaha Sakeena (University of Applied Sciences, Austria)

**Supervised Level Sets For Dermoscopic Image Segmentation**
Muntaha Sakeena (University of Applied Sciences, Austria); Rubata Riasat (X-Lab, Chinese Academy of Sciences, Austria); Farhan Riaz (National University of Sciences and Technology (NUST), Pakistan); Ali Hassan (National University of Sciences and Technology, Pakistan)

**Evaluation of facial attractiveness for purposes of plastic surgery using machine-learning methods and image analysis**
Lubomír Štěpánek (Faculty of Biomedical Engineering, Czech Technical University in Prague, Czech Republic); Pavel Kasal (Faculty of Biomedical Engineering, Czech Republic); Jan Mestak (First Faculty of Medicine, Czech Republic)

**Design and Optimization of an Autonomous, Ambulatory Cardiac Event Monitor**
Bertrand Massot (Univ. Lyon, INSA Lyon, INL CNRS UMR5270); Florin Hutu (Univ. Lyon, INSA Lyon, INRIA CITI); Claudine Gehin (Univ. Lyon, INSA Lyon, INL CNRS UMR5270); Norbert Noury (Univ. Lyon, UCBL, INL CNRS UMR5270)

**Device to monitor quiet breathe of CRD patients**
Sagar Sharma (Feroze Gandhi Institute of Engineering and Technology, India); Rakesh Mishra (Feroze Gandhi Institute of Engineering & Technology, GB University, India)

**Sensor based solution for cranial remodeling orthosis**
Radek Halfar and Jan Foltyn (VSB - Technical University of Ostrava, Czech Republic); David Ocza and Martin Cerny (VSB - Technical University of Ostrava, Czech Republic); Jiri Rosicky and Jan Rosicky (Invent Medical Group, Czech Republic); Ales Grygar (Invent Medical, Czech Republic)

**Comparison of home blood pressure measurement devices in real conditions**
Jan Havlík and Markéta Sůsáková (Czech Technical University in Prague, Czech Republic)

**Rat Cortical Layers Classification extracting Evoked Local Field Potential Images with Implanted Multi-Electrode Sensor**
Xiaying Wang (ETHZ, Switzerland); Michele Magno (ETH Zurich and University of Bologna, Switzerland); Lukas Cavigelli (ETH Zurich, Switzerland); Mufti Mahmud (Nottingham Trent University, United Kingdom (Great Britain)); Claudia Cecchetto and Stefano Vassanelli (University of Padova, Italy); Luca Benini (ETH Zurich, Switzerland)
Detailed Programme: Wednesday, September 19

Microelectrode Neuronal Activity Biomarker of the Internal Globus Pallidus in Dystonia Correlates with Long-term Neuromodulation Effects
Ondrej Klempir, Radim Krupicka and Vaclav Cejka (Faculty of Biomedical Engineering, Czech Technical University in Prague, Czech Republic); Robert Jech (First Medical Faculty, Charles University, Czech Republic)

**12:30 - 13:30**

L2: Lunch
Place: Gong - Food Court

**13:30 - 14:15**

K3: Keynote lecture - prof. Norbert Noury
Place: Gong - Conference hall
Chair: Martin Cerny (VSB - Technical University of Ostrava, Czech Republic)

**14:15 - 14:45**

PS1: Poster, Short Paper and Demo FLASH PRESENTATIONS
Place: Gong - Conference hall
Chairs: Martin Augustynek (VSB-Technical university of Ostrava, Czech Republic), Marek Penhaker (VSB - Technical University of Ostrava, Czech Republic)

Instructions:
Upload you 3 minutes presentations at registration desk on Wednesday, September 19 from 8:00 till 13:30. Be ready in conference hall from 14:15. Flash presentation of your posters, demo and short papers is obligatory.

List of presentation:

Towards Real-Time Patient Prioritization in Hospital Emergency Services
Bruno Lima (University of Porto - Faculty of Engineering & INESC TEC, Portugal); João Pascoal Faria (University of Porto - Faculty of Engineering, Portugal)

Evaluation of apathy by single 3D accelerometer in ecological situation. Case of patients with behavioral variant of fronto-temporal dementia
Yongjian Liu and Bénédicte Batrancourt (Inserm Unité 1127, France); Frederic Marin (University of Technology of Compiègne (UTC), France); Richard Levy (Inserm Unité 1127, France)

Mechatronic Design of Rehabilitation Brace
Josef Cernohorsky, Marcel Horak and Alex Richter (Technical University of Liberec, Czech Republic)

Analysis of cloud computing security in perspective of Saudi Arabia
Yara Alhumaidan and Moudhi Aljamea (IAU, Saudi Arabia); Lama Alajmi (Imam Abdulrahman Bin Faisal University, Saudi Arabia); Maqsood Mahmud (Imam Abdulrahman bin Faisal University Dammam, Saudi Arabia)

Supervised Level Sets For Dermoscopic Image Segmentation
Muntaha Sakeena (University of Applied Sciences, Austria)

Internet of Things Embedded System for Emotion Recognition
Aleksandra Kawala-Janik, Michał Podpora and Agnieszka Rozanska (Opole University of Technology, Poland); Zaneta Rachwanez-Szczechinska (Silesian University, Poland)

Safety and Security Architecture Analyses Framework for the Internet of Things of Medical Devices
Julia Rauscher and Bernhard Bauer (University of Augsburg, Germany)

DESIREE - a web-based software ecosystem for the personalized, collaborative and multidisciplinary management of primary breast cancer
Nekane Larburu, Naiara Muro, Mónica Arrue, Roberto Álvarez and Jon Kerexeta (Vicomtech, Spain)
Integrated Architecture for a mHealth Platform designed for e-Empowering teenagers to prevent obesity (TeenPower)
Marta Carvalho and Rodrigo Alves (CiTechCare - Center for Innovative Care and Health Technology (IPLeiria), Portugal); Catarina Reis (Computer Science and Communication Research Centre (CIIC), Portugal); Ricardo Martinho (School of Technology and Management, Polytechnic Institute of Leiria, Portugal); Pedro Sousa (CiTechCare - Center for Innovative Care and Health Technology (IPLeiria) & School of Health Science, Portugal); Pedro Gaspar (CiTechCare - Center for Innovative Care and Health Technology (IPLeiria) & School of Health Science, Portugal)

An Analysis of eHealth Modes, Usage Levels, Enablers, and Obstacles
Anuja Konda (Mission San Jose High School, USA)

Exploring Breast Cancer Patterns for Different Outcomes using Artificial Intelligence
Nekane Larburu, Mónica Arrue, Naiara Muro, Roberto Álvar and Jon Kerexeta (Vicomtech, Spain)

COPD Management by Symptom and Activity Tracking
Thomas Brunschwiler (IBM Research - Zurich, Switzerland); Rui Hu (IBM Research Zurich, Switzerland)

Telemedicine in Olomouc University Hospital
M. Stybar (NTC Olomouc)

14:45 - 15:00
BR4: Coffee break
Place: Gong - Food Court

15:00 - 17:30
PS2: Poster, Short Paper and Demo Section
Places: Gong - Food Court, Gong - Lobby

Chairs: Martin Augustyn (VSB-Technical university of Ostrava, Czech Republic), Marek Penhaker (VSB - Technical University of Ostrava, Czech Republic)

Remarks:
Poster installation on Wednesday, September 19 from 8:00 in Gong - Lobby area in front of conference rooms 4 and 5.

List of presentation:
Towards Real-Time Patient Prioritization in Hospital Emergency Services
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An Analysis of eHealth Modes, Usage Levels, Enablers, and Obstacles
Anuja Konda (Mission San Jose High School, USA)

COPD Management by Symptom and Activity Tracking
Thomas Brunschwiler (IBM Research - Zurich, Switzerland); Rui Hu (IBM Research Zurich, Switzerland)

Telemedicine in Olomouc University Hospital
M. Stybar (NTC Olomouc)

15:00 - 17:00

W3: WORKSHOP DECISION SUPPORT SYSTEMS FOR ONCOLOGY
Place: Gong - Room 4

Chairs: Nekane Larburu (Vicomtech, Spain), Bryan W. Scotney (University of Ulster, United Kingdom (Great Britain))

List of presentation:

Towards a CAD System for Breast Cancer Based on Individual Microcalcifications?
Evgenia Papavassileiou (Vrije Universiteit Brussel & IMEC, Belgium); Redona Brahimetaj, Frederik Temmermans and Bruno Cornelis (Vrije Universiteit Brussel, Belgium); Inneke Willekens and Johan de Mey (UZ Brussel, Belgium); Bart Jansen (VUB, Belgium)

Breast Mass Classification in Mammograms using Ensemble Convolutional Neural Networks
Andrik Rampun, Bryan W. Scotney, Philip Morrow and Hui Wang Wang (University of Ulster, United Kingdom (Great Britain))

Intelligent Clinical Decision Support Systems for Patient-Centered Healthcare in Breast Cancer Oncology
Boomadevi Sekar (Ulster University, United Kingdom (Great Britain)); Jean-Baptiste Lamy (Lecturer, France); Naiara Muro (Vicomtech, Spain); Anaïa Ugarriza Pinedo (Project Coordinator, Spain); Brigitte Seroussi (INSERM, France); Nekane Larburu (Vicomtech, Spain); Gilles Guézennec (Research, France); Jacques Bouaud (INSERM, Spain); Hui Wang Wang (University of Ulster, United Kingdom (Great Britain)); Frank Guijarro (Bilbomatica, Spain); Mónica Arrue (Vicomtech, Spain)

Exploring Breast Cancer Patterns for Different Outcomes using Artificial Intelligence
Nekane Larburu, Mónica Arrue, Naiara Muro, Roberto Álvarez and Jon Kerexeta (Vicomtech, Spain)

DESIREE - a web-based software ecosystem for the personalized, collaborative and multidisciplinary management of primary breast cancer
Nekane Larburu, Naiara Muro, Mónica Arrue, Roberto Álvarez and Jon Kerexeta (Vicomtech, Spain)

15:00 - 16:15

SE2: Visit of Dolni Vitkovice area (group1)
Reservation requested

Meeting point: Gong - Room 5

Take a tour of the conference venue. It is a National Cultural Monument - Dolni Vitkovice. A 100-minute guided tour around the blast furnace about the history of Vitkovice and the production of pig iron. Includes 30-minute break at the Bolt Tower – the great modern lookout tower built on the top og blast furnace. English language. Limited number of places. Free of charge.

Please register for this event on Registration desk.

Fully sponsored by VSB - Technical University of Ostrava
16:30 - 18:00

**SE3: Visit of Dolni Vitkovice area (group2)**

Reservation requested  
**Meeting point: Gong - Room 5**

Take a tour of the conference venue. It is a National Cultural Monument - Dolni Vitkovice. A 100-minute guided tour around the blast furnace about the history of Vitkovice and the production of pig iron. Includes 30-minute break at the Bolt Tower – the great modern lookout tower built on the top of blast furnace. English language. Limited number of places. Free of charge. Please register for this event on Registration desk.

Fully sponsored by VSB - Technical University of Ostrava

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18:30 – 24:00

**Conference Banquet**

**Places: Gong - Conference hall, Gong - Food Court, Gong – Lobby**

“Dance, music and good wine”

You could enjoy the evening of the Moravian-Silesian folklore and music.

Throughout the evening, cimbalom music ensemble together with dancing folk group will be played. Both these ensembles are part of VŠB – Technical university of Ostrava (Silesian ensemble of Helena Salichová).

Served dishes will be typical regional cuisine - Ostrava region and Moravian Wallachia region.

Served wine will be from small winegrowers from South Moravia (Czech wine) - Malanik winemaker.

All dishes served during this evening will be made from ingredients from local suppliers.

The evening social events are sponsored by VŠB – Technical University of Ostrava.
### Detailed Programme: Thursday, September 20

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:30 - 10:00</td>
<td>Registration&lt;br&gt;Place: Gong - Lobby</td>
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<tr>
<td>9:00 - 9:45</td>
<td>prof. Miroslav Voznak&lt;br&gt;Place: Gong - Conference hall&lt;br&gt;Chair: Radek Martinek (VSB - Technical University of Ostrava &amp; Faculty of Electrical Engineering and Computer Science, Czech Republic)</td>
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<tr>
<td>9:45 - 10:00</td>
<td>BR5: Coffee break&lt;br&gt;Place: Gong - Food Court</td>
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<tr>
<td>10:00 - 12:00</td>
<td>S5-1: COMMUNICATIONS AND NETWORKING&lt;br&gt;Place: Gong - Conference hall&lt;br&gt;Chairs: Arindam Ghosh (Oviva AG, Germany &amp; University of Trento, Italy), Radek Martinek (VSB - Technical University of Ostrava &amp; Faculty of Electrical Engineering and Computer Science, Czech Republic)</td>
</tr>
</tbody>
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#### List of presentation:

- **An Extensible Semantic Search Engine for Biomedical Publications**<br>  Christian Kohlschein, Daniel Klischies, Alexander Paulus, Andreas Burgdorf and Tobias Meisen (RWTH Aachen University, Germany); Markus Kipp (Ludwig Maximilian University of Munich, Germany)

- **Design and Development of a Biocultural Ontology for Personalized Diabetes Self-Management of American Indians**<br>  Juan Li and Shadi Alian (North Dakota State University, USA)

- **FHIR Ontology Mapper (FOM): Aggregating Structural and Semantic Similarities of Ontologies towards their Alignment to HL7 FHIR**<br>  Athanasios Kiourtis, Argyro Mavrogiorgou and Dimosthenis Kyriazis (University of Piraeus, Greece)

- **A JavaScript Web Framework for Rapid Development of Applications in IoT Systems for eHealth**<br>  Jonas Wahlsén (KTH, Sweden); Thomas Lindh (Royal Institute of Technology, Sweden)

- **Depression Severity Estimation from Multiple Modalities**<br>  Evgeny Stepanov (University of Trento, Italy); Stephane Lathuiliere (INRIA Grenoble, France); Shammar Chowdhury (BRAC University, Bangladesh); Arindam Ghosh (Oviva AG, Germany & University of Trento, Italy); Radu Laurentiu Vieriu, Nicu Sebe and Giuseppe Riccardi (University of Trento, Italy)

- **Medical Telerobotics and the Remote Ultrasonography Paradigm Over 4G Wireless Networks**<br>  Sotiris Avgousti (Cyprus University Of Technology, Cyprus); Andreas S. Panayides (University of Cyprus, Cyprus & University of New Mexico, USA); Efthychios G Christoforou and Argyris Argyrou (University of Cyprus, Cyprus); Antonis Jossif (PAEDI Center for Specialized Pediatrics, Cyprus); Panicos Masouras (Cyprus University Of Technology, Cyprus); Cyril Novales and Pierre Vieyres (Laboratoire PRISME - Universite d'Orleans, France)
S5-2: MEDICAL, BIOMEDICAL AND HEALTH INFORMATICS 3
Place: Gong - Room 4
Chairs: Andrés Navarro (Universidad Icesi, Colombia), Ruairi D O’Reilly (Cork Institute of Technology, Ireland)

List of presentation:

- Making Sense of Data Translating complexity for improved chronic pain management
  Leigh Anne Hepburn (DHI, United Kingdom (Great Britain)); Ellen Jaatun (NTNU & St Olav University Hospital, Norway)

- Detecting the Number of Persons in the Bed Area to Enhance the Safety of Artificially Ventilated Persons
  Alexander Gerka (OFFIS, Germany); Max Pfingsthorn and Christian Lüpkes (OFFIS - Institute for Information Technology, Germany); Kevin Spurenberg (Jade University of Applied Sciences, Germany); Melina Frenken (Jade University of Applied Sciences Oldenburg, Germany); Christian Lins (OFFIS - Institute for Information Technology, Germany); Andreas Hein (Universität Oldenburg, Germany)

- Wireless Multi-Hop Networking for a Group of Exercisers Spread in a Sports Ground
  Takuma Hamagami (Oki Electric Industry Co., Ltd., Japan); Yasutaka Kawamoto (Oki Electric Industry Co., Ltd. & Japan, Japan); Shinsuke Hara (Osaka City University, Japan); Hiroaki Yomo (Kansai University, Japan); Ryusuke Miyamoto (Meiji University & School of Science and Technology, Japan); Takunori Shimaoka (Osaka City University, Japan); Hiroyuki Okuhata (Synthesis Corporation, Japan)

- A Mobile Health Solution for Medication Adherence Intervention and its Real World Evidence
  Chao Jiang (Shanghai CareLinker Medical Technology Co., Ltd, P.R. China); Hongguang Zhang and Kai Liu (Shanghai CareLinker Medical Technology Co., Ltd., P.R. China); Shibao Zheng (Shanghai Jiao Tong University, P.R. China); Youren Yang, Fei Tian and Chu Feng (Shanghai CareLinker Medical Technology Co., Ltd, P.R. China)

- Outage performance of time switching energy harvesting wireless sensor network deploying NOMA
  Sy Nguyen (Binh Duong University, Vietnam & Binh duong, Czech Republic); Thang-Sang Nguyen (Binh Duong University, Vietnam); Tin Phu (Ton Duc Thang University, Ho Chi Minh City, Vietnam); Miroslav Voznak (VSB - Technical University of Ostrava, Czech Republic)

S5-3: DEVICES 4
Place: Gong - Room 5
Chairs: Daniele Bibbo (Università degli Studi Roma Tre, Italy), Antonino Proto (VSB - Technical University of Ostrava, Czech Republic)

List of presentation:

- Electrooculography as a Tool For Managing Application
  Lukas Peter (VSB-Technical University of Ostrava, Czech Republic); Antonino Proto and Martin Cerny (VSB - Technical University of Ostrava, Czech Republic)

- A Low Complexity Low Power Indoor Positioning System Based on Wireless Received Signal Strength
  Hung-Yi Li and Hsi-Pin Ma (National Tsing Hua University, Taiwan)

- Measurement System for Classification of Hand’s Gesture
  Lukas Peter (VSB-Technical University of Ostrava, Czech Republic); Antonino Proto and Marek Penhaker (VSB - Technical University of Ostrava, Czech Republic)

- Real-Time Continuous Gesture Recognition with Wireless Wearable IMU Sensors
  Yong-Ting Wang and Hsi-Pin Ma (National Tsing Hua University, Taiwan)

- Deep Convolutional Neural Network Learning for Activity Recognition using real-life sensor’s data in smart devices
  Maryam Fekri and Omair Shafiq (Carleton, Canada)

- Smart Saline Level Monitoring System Using ESP32 And MQTT-S
  Debjani Ghosh (MNNIT, Allahabad, India); Ankita Agrawal, Navin Prakash and Pushkal Goyal (GLA University, India)
12:00 - 12:15

Closing Ceremony

Place: Gong - Conference hall

Chairs: Martin Cerny (VSB - Technical University of Ostrava, Czech Republic), Norbert Noury (University of Lyon & Team Biomedical Sensors, France)

12:15 - 13:15

L3: Lunch

Place: Gong - Food Court
Conference Site Coordinates

VSB – TECHNICAL UNIVERSITY OF OSTRAVA CAMPUS

Address
VŠB – Technical University of Ostrava
17. listopadu 15/2172
708 33 Ostrava - Poruba
Czech Republic

Conference Room
Building AULA, room Rector’s Lounge (room No. NA178)
GPS: 49°49’52.4”N 18°09’48.6”E
https://goo.gl/maps/ZnM7XIC1wN72

Public Transport Connections:
Tramway stop Hlavní třída: tramway lines 7, 8, 9, 17 (from city center direction Vřesínská)
DOLNÍ VÍTKOVICE AREA

Address
Dolní Vitkovice
Ruská 2993
703 00 Ostrava-Vítkovice
Czech Republic

Main Conference Room
Building GONG
GPS: 49°49'4.25"N 18°16'35.25"E
https://goo.gl/maps/mWiShn3UFn12

Public Transport Connections:
Tramway stop Dolní Vitkovice: tramway lines 1, 2, 6, 10

map of the area
The conference will be in the Dolní Vitkovice area in the **Gong building, 2nd floor**

**Gong building, 2nd floor map:**
### How to Reach Gong – Conference Site

#### From IMPERIAL HOTEL OSTRAVA (City center)

**Public Transport**
- Tram number 1, 2 from the stop **ELEKTRA** (directions: 1 - Dubina, 2 - Výškovice) to the **DOLNÍ VÍTKOVICE** stop.
- Travel time 15 minutes incl. walk from tramway stop to conference venue.

**Walk**
- 2.4 km, 35 minutes
  - [https://mapy.cz/s/31YFN](https://mapy.cz/s/31YFN)

**Conference Shuttle Bus**
- Departure times direction GONG: TUE – THU 8:20
- Meeting point: Hotel IMPERIAL Lobby, conference staff will be presented
- Departure times direction Hotel Imperial: TUE and WED 23:30
- Meeting point: in front of GONG building

**QR code:** walking route to GONG

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#### From HOTEL GARNI VSB TU OSTRAVA

**Conference Shuttle Bus**
- Conference provides a free shuttle bus to the conference site.
  - Departure times direction GONG: TUE – THU 7:45
  - Meeting point: Hotel Garni Lobby, conference staff will be presented
  - Departure times direction Hotel Garni: TUE and WED 23:30
  - Meeting point: in front of GONG building

**Public Transport**
- Bus number 37 from the **STUDENTSKÉ KOLEJE** stop (direction: ÚAN) to the **ÚAN** stop and transfer to the **NÁMĚSTÍ REPUBLIKY** tramway stop (direction: Výškovice), there take the tram number 1 or 2 to the **DOLNÍ VÍTKOVICE** stop.
- Travel time 45 minutes

**OR**
- Walk (10 minutes) to tram stop **REKTORÁT VŠB** take tram number 8 (direction: Hlavní nádraží) to the stop **KAROLINA**, there take the tram number 1 or 2 to the **DOLNÍ VÍTKOVICE** stop (direction: Výškovice).
- Travel time 30 minutes

**Taxi**
- CB Taxi Ostrava: +420 800 222 233
- Lux Taxi Ostrava: +420 723 531 431
Useful Links

The Official Guide of Ostrava

The official tourist guide of Ostrava. Services are provided free of charge.

https://www.visitostrava.eu/

Public Transport Timetables, Maps, Connections

One web page (app) for each public transport connection in the Czech Republic.

www.idos.cz

Ostrava Public city transport timetables – direct link

http://odis.idos.cz/spojeni/?&lng=E

Local Maps:

Czech provider of maps

https://en.mapy.cz/
Contacts

Local Organizing Team

**VSB – Technical University of Ostrava**
Faculty of Electrical Engineering and Computer Science
Biomedical Engineering Research Group
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708 33 Ostrava
Czech Republic

e-mail: bmeng@vsb.cz