

IWSSIP brings together researchers and developers from both academia and industry to report on the latest scientific and theoretical advances, to discuss and debate major issues and to demonstrate state-of-the-art systems. IWSSIP 2022 will follow the successful events previously held in Bratislava, Niteroi/Rio de Janeiro, Osijek, Budapest, Manchester, Poznan, Zagreb, Bratislava, Maribor, Bucharest, Prague, Chalkida, Rio de Janeiro, Sarajevo, Vienna, Dubrovnik, and London. Now IWSSIP is calling for papers about but not limited to the listed topics.

### **Topics of Interest**

The program includes keynote presented by eminent experts in the field, peer reviewed papers and invited and special sessions about but no limited to the following topics:

- **Signal Processing**
- **Image and Video Processing**
- **Speech and Audio Processing**
- **Multimedia**
- **Human Machine Interface**
- **Machine Learning**
- **Security**
- **Networks**
- **Wireless Communications**
- **Modern ICT in e-learning**

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**Galia Marinova**, Technical University of Sofia, Bulgaria

### **Review Chair**

**Ilia Iliev**, Technical University of Sofia, Bulgaria

### **Co-chair**

Boyanka Marinova (TUS), Georgi Iliev (TUS), Kalin Dimitrov (TUS), Valentina Markova (Bulgarian IEEE Section)

### **Organizing Chair**

**Galia Marinova**

Technical University of Sofia, Bulgaria

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## **Program for IWSSIP'2022**

June 01-03 2022, Vitosha Park Hotel, Room Vitosha 1 and 2

Link to all sessions in **Rooms Vitosha** and **Vitosha 1**: <https://meet.google.com/gms-nvzw-eea>

Link to all sessions in **Room Vitosha 2**: <https://meet.google.com/ije-jjqt-ibr>

These links are valid for all sessions in the corresponding rooms for the three conference days.

### **Wednesday, 01.06.2022, Room Vitosha**

8:00-9:00 Registration, Lobby to Room Vitosha

9:00-9:40 Opening of IWSSIP'2022, Welcome address from TU-Sofia officials and TPC Chair

9:40-11:00 **Keynote Lectures**

**Chair:** assoc.prof. Dr. Galia Marinova

9:40-10:20 **Unmanned Aerial Vehicles as a mobile measurement platform**

Luca de Vito (on-site)

10:10-10:50 **Digital Twins Technology: What Is the Future?**

Yevgeniya Sulema (online)

**11:00-11:15 Coffee Break, Lobby to Room Vitosha**

11:15-13:00 **Session "Image and Video Processing"- Part 1**

Room Vitosha 1

Chair: Gregor Rozinaj, Hristomir Yordanov

11:15-11:30 **Kilicarslan Automated Dental Panoramic Image Segmentation Using Transfer Learning Based CNNs**

Tulin Caylak, Imam Samil Yetik, Ahmet Culhaoglu, Kaan Orhan and Mehmet Ali (on-site)

11:30-11:45 **Transferring Facial Expressions to Digital Character**

Lidija Krstanović, Slobodan Morača, Angela Fajsi, Marija Varga and Aleksandar Rajić (on-site)

11:45-12:00 **Adaptive Bilateral Filtering Detection Using Frequency Residuals for Digital Image Forensics**

A. U. Shehin and Deepa Sankar (online)

12:00-12:15 **The Impact of Preprocessing on Face Recognition using Pseudorandom Pixel Placement**

Muhammad Sabirin Hadis, Junichi Akita, Masashi Toda and Nurzaenab Nurzaenab (online)

- 12:15-12:30 **Ensembles of fractal descriptors with multiple deep learned features for classification of histological images**  
Leonardo Henrique da C. Longo, Marcelo Z. Do Nascimento, Guilherme F. Roberto, Alessandro S. Martins, Luis Fernando S. dos Santos and Leandro A. Neves (online)
- 12:30-12:45 **Image Segmentation For Autonomous Driving Using U-Net Inception**  
Syed Muhammad Fasih Hussain, Syed Muhammad Hamza and Abdul Samad (online)
- 12:45-13:00 **Multidimensional Shannon entropy ( $H_M$ ) as an approach to classify H&E colorectal images**  
Luiz F. S. dos Santos, Guilherme B. Rozendo, Marcelo Z. Do Nascimento, Thaína A. A. Tosta, Leonardo H. da C. Longo and Leandro A. Neves (online)
- 11:15-13:15 **Training Workshop – Part 1 “English –The right course for you”**  
*Room Vitosha 2*  
Lecturer: Dr. Edona Vinca, Mother Teresa University, Skopje, North Macedonia
- 13:00-14:30 Lunch in Restaurant Magiko**
- 14:30-16:30 **Session “Modern ICT in e-learning”**  
*Room Vitosha 1*  
Chair: Marsida Ibro, Gaspar Music
- 14:30-14:45 **Analysis of Teachers’ Satisfaction with Online Learning During the COVID-19 Pandemic**  
Yaser Saleh, Nuha El-Khalili, Nesreen Otoum, Mohammad Al-Sheikh Hasan, Saif Abu-Aishah and Izzeddin Matar (online)
- 14:45-15:00 **Hybrid Learning Spaces With Immersive Audio**  
Robin Støckert and Aleksander Tidemann (on-site)
- 15:00-15:15 **Distance learning of programmable logic control: an implementation example**  
Gašper Mušič, Simon Tomažič and Vito Logar (on-site)
- 15:15-15:30 **Student-Oriented PLC Implementation Using Raspberry Pi, PiFace Digital 2 and Codesys**  
Gorazd Karer (on-site)
- 15:30-15:45 **Active Learning Used for Teaching the Topic “Design of Finite Impulse Response Filters in MATLAB” in the Course “Digital Signal Processing”**  
Adriana Borodzhieva (online)
- 15:45-16:00 **Project-Based Learning for Teaching Diffie-Hellman Algorithm, Elgamal Variant, in the Course “Telecommunication Security”**  
Adriana Borodzhieva (online)

**16:00-16:15 Literature review on FPGA-based e-learning: power consumption design methodologies perspective**

Marsida Ibro and Galia Marinova (on-site)

**14:30-16:30 Training Workshop– Part 2 “Write it right, write it Academic. Course on academic English”**

*Room Vitosha 2*

Lecturer: Dr. Ratko Knezevic, University of Bihac, Bosnia and Herzegovina

***16:30-16:45 Coffee Break, Lobby to Room Vitosha***

**16:45-18:00 Session “ Machine Learning ” – Part 1**

Room Vitosha 1

Chair:Simeon Tsvetanov

**16:45-17:00 PL-kNN: A Parameterless Nearest Neighbors Classifier**

Danilo Samuel Jodas, Leandro Aparecido Passos, João Paulo Papa and Ahsan Adeel (online)

**17:00-17:15 Identification of herbarium specimens: a case study with Piperaceae Giseke family**

Alexandre Kajihara, Diego Bertolini and André Luis Schwerz (online)

**17:15-17:30 A UAV Object Detection Benchmark for Vision-assisted Powerline Element Inspection**

Emmanouil Patsiouras, Vasileios Mygdalis and Ioannis Pitas

**17:30-17:45 UML Class Model Generation of Images Using Neural Networks**

Irina-Gabriela Nedelcu, Anca Daniela Ionita, Stefan Alexandru Mocanu and Daniela Saru (online)

**17:45-18:00 Gemstone classification using ConvNet with transfer learning and fine-tuning**

Willian Freire, Aline Amaral and Yandre Costa (online)

**18:00-18:15 Deep Learning Image Classification for Pneumonia Detection**

Simeon Tsvetanov, Teodor Boyadzhiev and Stela Dimitrova (on-site)

**16:45-18:00 Training Workshop – Part 3**

Lecturers-moderators:

*Room Vitosha 2*

Dr. Ratko Knezevic, University of Bihac, Bosnia and Herzegovina

Dr. Edona Vinca, Mother Teresa University, Skopje, North Macedonia

**Thursday, 02.06.2022**

**8:00 – 10:00 CEEPUS Workshop for the network BG-1103-07-2223 - Modelling, Simulation and Computer-aided Design in Engineering and Management**

**Room of the Academic council, Rectorate of TU-Sofia, Building 1**

Chair: Galia Marinova

**9:00-10:00 Session “Multimedia”**

Room Vitosha 1

Chair: Jiří Melnikov

**9:00-9:15 High-quality Audio Network Transmissions with Raspberry PI**

Sven Ubik and Jiří Melnikov (on-site)

**9:15-9:30 Content-aware bitrate-based video quality assessment metric**

Jelena Šuljug and Snježana Rimac-Drlje (on-site)

**9:30-9:45 Assessment Quality of Modify Images by CIECAM02, CAM16, CAM20u Models**

Sara Ali Alwash, Ali Ihsan Alanssari, Volodymyr Pyliavskiy, Olena Osharovska, Mykola Bermas and Artem Taran (online)

**9:45-10:00 Evaluating multimodal strategies for multi-label movie genre classification**

Marco Aurelio Deoldoto Paulino, Valéria Delisandra Feltrim and Yandre Costa (online)

**9:00-10:00 Session “Security” – Part 1**

*Room Vitosha 2*

Chair: Rosen Miletiev

**9:00-9:15 Low-Complexity Speech Spoofing Detection using Instantaneous Spectral Features**

Arun Sankar M S, Phillip L. De Leon, Steven Sandoval and Utz Roedig (online)

**9:15-9:30 Pathway of applications of cyber security standards and rules in Albania**

Manjola Zeneli (on-site)

**9:30-9:45 From Network Package Flow to Images: How to Accurately Detect Anomalies in Computer Networks**

Paulo Galego, Douglas Rodrigues, Lucas Janeiro, Rafał Scherer, João Papa and Kelton Costa (on-site)

**9:45-10:00 Semi-supervised novelty detection with one class SVM for SMS spam detection**

Suleiman Yerima and Dr. Abul Bashar (online)

**10:00-10:15 Coffee Break, Lobby to Room Vitosha**

**10:15-11:45 Keynote Lectures - Room Vitosha**

**Chair:** assoc.prof. Dr. Galia Marinova

**10:15-11:00 Distinguished IEEE Lecture: Complex Networks**

Ljiljana Trajkovic (on-site)

**11:00-11:45 Explainable-by-design Deep Learning**

Plamen Angelov (online)

**11:45-12:30 Session “Networks”**

Room Vitosha 1

**Chair:** Vassil Guliashki

**11:45-12:00 Practical analysis on the algorithm of the Cross-Site Scripting Attacks**

Blerton Abazi and Edmond Hajrizi (online)

**12:00-12:15 Power Line Communication for Building Automation Using Visible Light Sensing Systems**

Hristo Ivanov, Pasha Bekhrad and Erich Leitgeb (on-site)

**12:15-12:30 Assessment of Powerline Technology based on integrated evaluation kit**

Pasha Bekhrad, Kushal Madane, Hristo Ivanov, Erich Leitgeb and Yingjie Liu (on-site)

**11:45-12:30 Session “Security” – Part 2**

Room Vitosha 2

**Chair:** Galia Marinova

**11:45-12:00 Soap messaging to provide quality of protection through Kerberos Authentication**

Grela Ajvazi and Festim Halili

**12:00-12:15 Experimental setup for Hardware Encryption logic evaluation for e-learning**

Eriselda Malaj, Marsida Ibro and Galia Marinova (on-site)

**12:15-12:30 Hardware Encryption logic on FPGA and Power Consumption**

Marsida Ibro and Galia Marinova (on-site)

**12:30-13:30 Lunch in Restaurant Magiko**

**13:30-15:00 Session “Image and Video Processing”- Part 2**

Room Vitosha 1

**Chair:** Snježana Rimac-Drlje

- 13:30-13:45 **ComplexWoundDB: A Database for Automatic Complex Wound Tissue Categorization**  
Talita Pereira, Regina Popim, Leandro Passos, Danillo Pereira, Clayton Pereira and Joao Papa (on-site)
- 13:45-14:00 **Deep Localization of Mixed Image Tampering Techniques**  
Robin Yancey (online)
- 14:00-14:15 **SSTRN: Semantic Style Transfer Reference Network for Face Super-Resolution**  
Saghar Farhangfar, Aryaz Baradarani, Mohammad Ali Balafar and Mohammad Asadpour (online)
- 14:15-14:30 **Development of a landslide detection surveillance system**  
Astha Agrawal and Subrat Kar (online)
- 14:30-14:45 **Recognition of the astronomical images using the Sobel filter**  
Sergii Khlamov, Iryna Tabakova and Tetiana Trunova (online)
- 14:45-15:00 **Comparing image preprocessing techniques for detection of bubbles in leaks**  
André Fernandes, Fernanda Passos and Aura Conci (online)

## **Session “Machine Learning”- Part 2**

Room Vitosha 2

Chair: Hristo Ivanov

- 13:30-13:45 **B-VPL: A Binary Volleyball Premier League optimization algorithm for Feature Selection**  
Edjola Naka and Vassil Guliashki (on-site)
- 13:45-14:00 **Reducing the complexity of candidate selection using Natural Language Processing**  
Emiliano Mankolli (on-site)
- 14:00-14:15 **Non-Intrusive Appliance Identification Using Machine Learning and Time Domain Features**  
Hajer Alyammahi and Panos Liatsis (online)
- 14:15-14:30 **Classification of H&E images exploring ensemble learning with two-stage feature selection**  
Jaqueline J. Tenguam, Leonardo H. C. Longo, Adriano B. Silva, Paulo R. de Faria, Marcelo Z. Do Nascimento and Leandro A. Neves (online)



## **Social Program for on-site participants**

15:00-18:00 **Guided Tour in Sofia city center** with a professional guide

The participants in the tour will be driven to Sofia city center by bus.  
Bus waiting in front of Vitosha Park Hotel

15:15-17:00 **Session “Image and Video Processing”- Part 3**

Room Vitosha 1

Chair: Alexander Bekyarski

15:15-15:30 **Using Thermography for Breast Cancer Neoadjuvant Treatment**

Adriel dos Santos Araujo, Milena H. S. Issa, Angel Sanchez, Débora C. Muchaluat-Saade and Aura Conci (online)

15:30-15:45 **DFU-VGG a Novel and Improved VGG-19 Network for Diabetic Foot Ulcer Classification**

Francisco Das Chagas Torres dos Santos, Rodrigo de Melo Souza Veras, Elineide Silva dos Santos, Luís Henrique Silva Vogado, Márcia Ito, Andrea Bianchi and Joao Manuel R. S. Tavares (online)

15:45-16:00 **Visual Quality Inspection of Pomegranate Crop Using a Novel Dataset and Deep Learning**

Avraam Koufatzis, Eleni Vrochidou and George Papakostas

16:00-16:15 **A semi-automatic approach for quantitative analysis of histological images**

Sérgio Silva Jr., Mateus Carvalho, Celso Calomeno, Julio Cesar Polonio, Franklin César Flores, Jaqueline Rinaldi and Yandre Costa (online)

16:15-16:30 **Mitigating the Effects of Class Noise Using Two-Level Filtering Learner Algorithm**

Eman Allogmani and Darsana Josyula (online)

16:30-16:45 **The astronomical object recognition and its near-zero motion detection in series of images using in situ modeling**

Sergii Khlamov, Vadym Savanevych, Iryna Tabakova and Tetiana Trunova (online)

15:15-16:30 **Session “Signal Processing. Speech and Audio Processing”**

Room Vitosha 2

Chair: Zdravka Simeonov

15:15-15:30 **Investigation for the Need of Traditional Data-Preprocessing when Applying Artificial Neural Networks to FMCW-Radar Data**

Jakob Valtl, Javier Mendez, Gianfranco Mauro, Antonio Cabrera and Vadim Issakov

**15:30-15:45 Performances Comparison between Low Density Parity Check Codes and Polar Codes**

Adriana-Maria Cuc, Cristian Grava, Florin Lucian Morgoş and Traian Adrian Burca

**15:45-16:00 Efficient Deep Model Training for Coordinated Beam-Forming in mmWave Communications**

Ilias Nikas, Christos Mavrokefalidis and Kostas Berberidis

**16:00-16:15 An Approach for Coefficients Optimization in Adaptive Filter Signal Equalization**

Vassil Guliashki and Galia Marinova

**19:30-24:00 Gala Dinner in the Restaurant Toscana in Vitosha Park Hotel**

<https://www.vitoshaparkhotel.com/restorant-toscana/>  
with Live Bulgarian Folklore program, Music and DJ.

**Friday, 03.06.2022, Room Vitosha**

**8:00-10:30 Room Vitosha 1**

**8:00-9:30 Session “Wireless Communications”**

**Room Vitosha 1**

Chair: Vassil Guliashki

**8:00-8:15 Performance Optimization of 6LoWPAN Systems for RF AMR System  
Using Turbo and LDPC Codes**

Mehmet Lafcı and Özgür Ertuğ (online)

**8:15-8:30 Energy consumption management under quality-of-service constraints in  
the context of small cell networks**

Mohamad Younes and Yves Louet (online)

**8:30-8:45 Interference management for better coverage of future cellular networks**

Mohamad Younes and Yves Louet (online)

**9:00-9:15 Near Optimal Joint Switched Beamforming and User Pairing for MISO  
Communication System**

Youssef Fakih (online)

**9:15-9:30 LoRaWAN Smart City Applications**

Atanas Kostadinov and Krassimir Kolev (online)

**9:30-10:30 Special Session on Small Scale Smart Sustainable Systems – 5S**

**Room Vitosha 1**

Chair: Edmond Hajrizi

**9:30-9:45 UBT 5S (Small Scale Smart Sustainable System) – Invited lecture**

Edmond Hajrizi (on-site)

**9:45-10:00 Data augmentation techniques for expanding the dataset in the task of  
image processing**

Blerina Rrmoku, Edmond Hajrizi and Besnik Qehaja (on-site)

**10:00-10:15 Image Analysis of Water Level using Remote Sensing**

Behar Haxhismajli, Edmond Hajrizi and Besnik Qehaja (on-site)

**10:15-10:30 5G Network Deployment at UBT: Features, Capabilities and Challenges**

Xhafer Krasniqi, Betim Gashi, Osman Osmani and Edmond Hajrizi (on-site)

**8:00-10:30 Room Vitosha 2**

**8:00-8:45 Special Session on Remote Sensing and Human Machine Interface**

Chair: Dusan Gleih

**8:00-8:15 An approach to EEG based BCI for motor imagery using time-frequency  
representation and CNN**

Žofia Rohutná and Radoslav Vargic (on-site)

- 8:15-8:30 **How Service Oriented Architecture enhances utilization of robots in commonplace. A case study on the Polog region.**  
Bleran Veseli and Festim Halili
- 8:30-8:45 **Landslide Andslide Monitoring Based on Inertial Measurement Units and ZIGBEE Network**  
Rosen Miletiev, Emil Iontchev and Rumen Yordanov (on-site)
- 8:45-9:00 **Advanced techniques for landmine detection using UAV**  
Blaž Pongrac, Andrej Sarjas and Dusan Gleich(on-site)
- 9:00-9:15 **Truncated SVD Based Microwave Tomography Imaging for Stepped Frequency Ground Penetrating Radar**  
Venceslav Kafedziski
- 9:15-9:30 **Different Antennas Consideration for Advanced GPR Applications**  
Nikola Bošković, Nebojša Dončov
- 9:30-10:45 **Special Session on Smart Energy**  
**Chair:** Radoslav Vargic
- 9:30-9:45 **Design of Photovoltaic Systems for Residential Houses**  
Ivan Katrencik, Julius Golej, Monika Zatrochova, Miroslav Panik and Branislav Misota
- 9:45-10:00 **Identification of Generator Active Power Oscillations Stability Measure**  
Marian Tarnik, Martin Ernek, Martin Dodek, Eva Miklovicova, Adrian Ilka and Tomas Murgas (online)
- 10:00-10:15 **Advanced load shaping using battery**  
Juraj Londak, Radoslav Vargic and Matúš Navarčík (on-site)
- 10:15-10:30 **Multiple-camera System for 3D Object Detection in Virtual Environment using Intelligent Approach**  
Vivek Dwivedi, Mansi Bhatnagar, Jaroslav Venjarski, Gregor Rozinaj and Simon Tibensky (on-site)
- 10:30-10:45 **Comprehensive Electric load forecasting using ensemble machine learning methods**  
Mansi Bhatnagar, Vivek Dwivedi, Divyanshu Singh and Gregor Rozinaj (on-site)
- 10:30-10:45 Coffee Break, Lobby to Room Vitosha**
- 10:45-11:30 Closing IWSSIP'2022 and Parallel events**  
Certificates, Documents, Announcement of IWSSIP'2023