

Technical Program

BalkanCom 2023

Program at a Glance

	June 6 (TUE)	June 7 (WED)	June 8 (THU)
8:30 – 9:00	OPENING AND WELCOME CEREMONY	INVITED SPEAKER	
9:00 – 10:30	Session 1 <u>Communication Protocols and Networking</u>	Session 5 <u>Wireless Channel Propagation and Modeling</u>	Session 9 <u>AI Empowered Cellular Communications and Computing Service Management</u>
10:30 - 10:45	Coffee break	Coffee break & Poster session	Coffee break
10:45 – 11:30	Keynote 1 (Prof. Ness B. Shroff)	Keynote 3 (Prof. Mehdi Bennis)	Keynote 4 (Prof. Murat Uysal)
11:30 - 11:45	Coffee break	Coffee break & Poster session	Coffee break
11:45 – 13:15	Session 2 <u>Signal Processing for Communications</u>	Session 6 <u>Multiple Access Techniques</u>	Session 10 <u>Internet of Things and Smart Applications</u>
13:15 - 14:15	Lunch break	Lunch break	Lunch break
14:15 – 15:00	Keynote 2 (Prof. Malamati Louta)	PANEL	Keynote 5 (Prof. Emina Soljanin)
15:00 - 15:15	Coffee break	Coffee break	Coffee break
15:15 – 16:45	Session 3 <u>Network Management</u>	Session 7 <u>Wireless Powered and Energy Harvesting Communications</u>	Session 11 <u>Student Session</u>
16:45 - 17:00	Coffee break	Coffee break	Coffee break
17:00 – 18:15	Session 4 <u>Secure Communications</u>	Session 8 <u>Terahertz Communications</u>	Session 12 <u>Unconventional Communications and Computing</u>
18:30 –	WELCOME RECEPTION	BOSPORUS FERRY TOUR & CONFERENCE BANQUET	CLOSING SESSION

*All tutorials and technical sessions will take place at the **Fazıl Say Conference Hall** of [BAU](#).

Detailed Technical Program

TUESDAY

Opening and Welcome Ceremony

Time: Tuesday, June 6, 2023 (8:30 - 9:00)

Welcome by BalkanCom'23 General Chairs and Technical Program Committee Chairs.

Session 1: Communication Protocols and Networking

Time: Tuesday, June 6, 2023 (9:00 - 10:30)

Chair: Ece Gelal Soyak (Bahcesehir University, Turkey)

A Performance Evaluation of Flooding Methods on Real Networks Topologies

Asterios Papamichail (Ionian University, Greece); Georgios Tsoumanis (University of Ioannina, Greece); Spyros Sioutas (University of Patras, Greece); Konstantinos Oikonomou (Ionian University, Greece)

Scalability and Sample Efficiency Analysis of Graph Neural Networks for Power System State Estimation

Ognjen Kundacina (University of Novi Sad, Serbia); Gorana Gojic (The Institute for Artificial Intelligence Research and Development of Serbia, Serbia); Mirsad Cosovic (University of Sarajevo, Bosnia and Herzegovina); Dragiša Mišković (The Institute for Artificial Intelligence Research and Development of Serbia, Serbia); Dejan Vukobratović (University of Novi Sad, Serbia)

Load Balancing of Virtual Network Functions through Packet Delegation

Alexandros Zervopoulos and Konstantinos Oikonomou (Ionian University, Greece)

QoE Estimation for the Wi-Fi Edge with Gradient Boosting-based Machine Learning

Berke Argın and Mehmet Özgün Demir (Lifemote Networks, Turkey); Aysun Gurur Onalan (Koc University, Turkey); Elif Dilek Salık (Lifemote Networks, Turkey); Ece Gelal Soyak (Bahcesehir University, Turkey)

Keynote 1

AI-EDGE: Designing future XG networks and distributed intelligence

Prof. Ness B. Shroff

Time: Tuesday, June 6, 2023 (10:45 - 11:30)

TUESDAY

Session 2: Signal Processing for Communications

Time: Tuesday, June 6, 2023 (11:45 - 13:15)

Chair: Galia Marinova (Technical University of Sofia, Bulgaria)

A Framework for Physical Layer Network Coding with Multiple antennas for BPSK

Mert Ilguy and Berna Özbek (Izmir Institute of Technology, Turkey)

Issue of the effective dielectric constant for a co-planar patch antenna made with inset technique

Mehmet Duman (Duzce University, Turkey)

The Magic of Quantum Computing for Microwave Computer-Aided Design: A Brief Overview

Lida Kouhalvandi (Dogus University, Turkey); Mohsen Koohestani (ESEO School of Engineering & IETR, University of Rennes 1, France); Serdar Ozoguz (Istanbul Technical University, Turkey); Ladislau Matekovits (Politecnico di Torino, Italy)

High-Speed, Real Time Sensor Data Acquisition and Transfer based on the Raspberry Pi Single Board Computer

Georgios Kokkinis, Arnold Horn, Khaled Ibrahim and Christoph Mayer (Silicon Austria Labs GmbH, Austria); Alexander Teufel (Atos IT Solutions and Services GmbH, Austria); Rudolf Heer (Silicon Austria Labs GmbH, Austria)

Generative Lossy Sensor Data Reconstructions for Robust Deep Inference

Silvija Kokalj-Filipović and Mathew Williams (Rowan University, USA)

Keynote 2

Trust-aware Human-centric NG-IoT systems: the way ahead

Prof. Malamati Louta

Time: Tuesday, June 6, 2023 (14:15 - 15:00)

TUESDAY

Session 3: Network Management

Time: Tuesday, June 6, 2023 (15:15 - 16:45)

Chair: Jale Sadreddini (Ericsson, Canada)

Multivariate and Multistep Traffic Prediction for NextG Networks with SLA Violation Constraints

Evren Tuna (Bahcesehir University, Turkey); Alkan Soysal (Virginia Tech, USA)

Accuracy and Coverage Analysis of IP Geolocation Databases

Abdullah Yasin Nur (University of New Orleans, USA)

State Management of Knowledge Base in Intent Management Functions in 6G Networks

Danesh Daroui and Mirko D'Angelo (Ericsson Research, Sweden); Leonid Mokrushin (Ericsson, Sweden); Marin Orlić (Ericsson Research, Sweden); Ahmet Cihat Baktir (Ericsson, Turkey)

Open-Source Network Slice Orchestration for B5G/6G: Assurance Use Case

Simona Marinova and Alberto Leon-Garcia (University of Toronto, Canada)

PIM Detection in Wireless Networks as an Anomaly Detection Problem

Gokcan Cantali (Bogazici University, Turkey); Eren Deniz (Yupana Inc, USA & Ege University, Turkey); Ozcan Ozay and Onur Yildirim (Yupana Inc, USA); Gürkan Gür (Zurich University of Applied Sciences (ZHAW), Switzerland); Fatih Alagoz (Bogazici University, Turkey)

Session 4: Secure Communications

Time: Tuesday, June 6, 2023 (17:00 - 18:15)

Chair: Albert Levi (Sabanci University, Turkey)

It Is Rude to Ask a Sensor Its Age-of-Information: Status Updates Against an Eavesdropping Node

Laura Crosara (Università degli Studi di Padova, Italy); Nicola Laurenti (University of Padova & CNIT, Italy); Leonardo Badia (Università degli Studi di Padova, Italy)

The Generalized Secretary Problem Algorithm for Secrecy-Achieving Relay Selection: A Good Complexity-Security Trade-off?

Elmehdi Illi and Marwa Qaraqe (Hamad Bin Khalifa University, Qatar); Faissal El Bouanani (ENSIAS, Mohammed V University in Rabat, Morocco)

Challenges of blockchain in higher education institutions for protection against diploma forgery

Avni Rustemi (State University of Tetovo, Macedonia), Vladimir Atanasovski (Ss Cyril and Methodius University in Skopje, Macedonia), Aleksandar Risteski (Ss Cyril and Methodius University in Skopje, Macedonia), Pero Latkoski (Ss Cyril and Methodius University in Skopje, Macedonia)

Remote Monitoring and Control of Refrigerators Through MQTT Protocol with AES Encryption

Ümit Güler (Ege University & Öztaş Global Soğutma, Turkey); Radosveta Sokullu (Ege University, Turkey)

WEDNESDAY

Invited Speaker

Time: Wednesday, June 7, 2023 (8:30 - 9:00)

6GEN-LAB: Designing 6G – AI as Enabler of Autonomous Networks

Dr. Gökhan Kalem (Turkcell, Turkey)

Session 5: Wireless Channel Propagation and Modeling

Time: Wednesday, June 7, 2023 (09:00 – 10:30)

Chair: Mihael Mohorcic (Jozef Stefan Institute, Slovenia)

Statistical Characterization of FSO-based Airborne Backhaul Links

Mohammed Elamassie (Özyeğin University, Turkey); Murat Uysal (Ozyegin University, Turkey)

Multi-State Inter-Satellite Channel Models

Eray Guven (Ecole Polytechnique de Montreal, Canada); Olfa Ben Ben Yahia (Istanbul Technical University, Turkey); Gunes Karabulut Kurt (Ecole Polytechnique de Montreal, Canada)

Performance Analysis of Gateway-Relayed Low Earth Orbit Satellite Networks

Bilal Çiçek and Semiha Tedik Başaran (Istanbul Technical University, Turkey)

Reinforcement Learning for Simplified Training in Fingerprinting Radio Localization

Nicola Novello and Andrea M Tonello (University of Klagenfurt, Austria)

XAI for Self-supervised Clustering of Wireless Spectrum Activity

Ljupcho Milosheski, Gregor Cerar, Blaz Bertalanic and Carolina Fortuna (Jozef Stefan Institute, Slovenia); Mihael Mohorcic (Jozef Stefan Institute & Jozef Stefan International Postgraduate School, Slovenia)

Vector Autoregression Model Utilization for Massive-MIMO Channel Denoising

Dmitry Artemasov (Skolkovo Institute of Science and Technology, Russia); Alexander Blagodarnyi and Alexander Sherstobitov (Moscow Institute of Physics and Technology, Russia); Vladimir Lyashev (Moscow Institute of Physics and Technology & Huawei Technologies Co. Ltd., Russia)

Poster Session

Time: Wednesday, June 7, 2023 (10:30 – 11:45)

A Doherty Power Amplifier for 5G Applications (Student paper)

Hasan Konanç (Istanbul Technical University & Baykar Tech, Turkey)

IoT And Physical Cyber Security Intrusion Detection Based On Supervised Machine Learning (Student paper)

Abdallah Suhaib Sultan (Bahçeşehir University & BAU, Iraq); Pinar Sarisaray Boluk (Bahcesehir University, Turkey)

Zero Knowledge Proof Based Authentication to E-Health Systems For Refugees (Student paper)

Arzum Aydın, Konurhan Ozpinar, İrfan Burak Ozer and Ayse Zeynep Subasi (Istanbul Technical University, Turkey)

WEDNESDAY

Keynote 3

VisionX: Semantic Communication Meets System2 ML

Prof. Mehdi Bennis

Time: Wednesday, June 7, 2023 (10:45 - 11:30)

Session 6: Multiple Access Techniques

Time: Wednesday, June 7, 2023 (11:45 – 13:15)

Chair: Dejan Vukobratovic (University of Novi Sad, Serbia)

Full-Duplex Cooperative NOMA-based mmWave Networks with Fluid Antenna System (FAS) Receivers

Leila Tlebaldiyeva (Nazarbayev University, Kazakhstan); Sultangali Arzykulov (King Abdullah University of Science and Technology, Saudi Arabia); Theodoros Tsiftsis (University of Thessaly, Greece & Jinan University, China); Galymzhan Nauryzbayev (Nazarbayev University, Kazakhstan)

Performance Analysis and Enhancement through Cooperative NOMA in STAR-RIS-aided Systems

Torebek Toregozhin, Mohd Hamza Naim Shaikh and Galymzhan Nauryzbayev (Nazarbayev University, Kazakhstan)

Grant Free NOMA with Deep Learning for Massive IoT Applications

Abdullah Balci (Yalova University, Turkey); Radosveta Sokullu (Ege University, Turkey)

User Pairing and Beamforming Design in mmWave CR-NOMA Networks

Ömer Faruk Akyol and Semiha Tedik Başaran (Istanbul Technical University, Turkey); Ibrahim Hokelek (TUBITAK BILGEM, Turkey); Ali Gorcin (Yildiz Technical University, Turkey)

On the Performance of the Free-Access Tree Algorithm with MPR, SIC, and Single-Slot Memory

Syed Muhammad Ali (Aalborg University, Denmark); Marko Beko (ULHT/UNINOVA & UNINOVA, Caparica, Portugal); Dejan Vukobratović (University of Novi Sad, Serbia); Čedomir Stefanović (Aalborg University, Denmark)

PANEL

The Trends towards Communication in the 2030s and Beyond

Participants: Prof. Ness Shroff, Prof. Emina Soljanin, Prof. Aydın Sezgin

Time: Wednesday, June 7, 2023 (14:15 - 15:00)

Session 7: Wireless Powered and Energy Harvesting Communications

Time: Wednesday, June 7, 2023 (15:15 – 16:45)

Chair: Pinar Sarisaray Boluk (Bahcesehir University, Turkey)

Novel Scalable DNN-based Relay Selection Scheme for Wireless Powered Communication Networks

Gulnur Tolebi (Nazarbayev University, Kazakhstan); Yedilkhan Amirgaliyev (Suleyman Demirel University, Kazakhstan); Galymzhan Nauryzbayev (Nazarbayev University, Kazakhstan)

Deep Learning based Low Complexity Relay Selection for Wireless Powered Cooperative Communication Networks

Aysun Gurur Onalan and Sinem Coleri (Koc University, Turkey)

Two-Step Deep Reinforcement Q-Learning based Relay Selection in Cooperative WPCNs

Gulnur Tolebi (Nazarbayev University, Kazakhstan); Theodoros Tsiftsis (University of Thessaly, Greece & Jinan University, China); Galymzhan Nauryzbayev (Nazarbayev University, Kazakhstan)

Operation Altitude Optimization of Solar-Powered Rotary-Wing UAVs for FSO Backhauling

Khadijeh Ali Mahmoodi (Ozyegin University, Turkey); Mohammed Elamassie (Özyeğin Üniversitesi, Turkey); Murat Uysal (Ozyegin University, Turkey)

An energy-harvesting aware cluster head selection policy in underwater acoustic sensor networks

Çiğdem Eriş, Omer M Gul and Pinar Sarisaray Boluk (Bahcesehir University, Turkey)

Session 8: Terahertz Communications

Time: Wednesday, June 7, 2023 (17:00 – 18:15)

Chair: Mustafa Alper Akkas (Abant İzzet Baysal University, Turkey)

Outage Performance Analysis of Terahertz Band Drone-to-Ground Communications

Akhtar Saeed (DHA Suffa University, Pakistan & Sabanci University, Turkey); Ozgur Gurbuz (Sabanci University, Turkey); Fatih Alagoz (Bogazici University, Turkey)

Blockage Effects in RIS-enabled Communication

Fethi Okta, Ömer Faruk Akyol and Semiha Tedik Başaran (Istanbul Technical University, Turkey)

Terahertz Band Transmittance Modeling Tools: A Comparative Study

Berkay Sekeroglu (Bogazici University, Turkey); Suat Utku Inal, Utku Gursoy, Mikail Erdem and Ozgur Gurbuz (Sabanci University, Turkey)

D-Band RIS as a Reflect Array: Characterization and Hardware Impairments Study

Ehsan Tohidi (Fraunhofer HHI, Germany); Robert Stöcker and Julia-Marie Köszegi (Fraunhofer IZM, Germany); Slawomir Stanczak (Technische Universität Berlin & Fraunhofer Heinrich Hertz Institute, Germany)

THURSDAY

Session 9: AI Empowered Cellular Communications and Computing Service Management

Time: Thursday, June 8, 2023 (09:00 – 10:30)

Chair: Carolina Fortuna (Jozef Stefan Institute, Slovenia)

Machine Learning Operations Model Store: Optimizing Model Selection for AI as a Service

Gregor Cerar and Jernej Hribar (Jozef Stefan Institute, Slovenia)

Graph Neural Networks Based Anomalous RSSI Detection

Blaz Bertalanic (Jozef Stefan Institute, Slovenia); Matej Vnučec (University of Ljubljana, Slovenia); Carolina Fortuna (Jozef Stefan Institute, Slovenia)

Predictive Data Replication for XR Applications in Multi-Connectivity Enabled mmWave Networks

Muhammad Affan Javed (NYU WIRELESS, USA); Pei Liu (New York University, USA); Shivendra Panwar (New York University & Tandon School of Engineering, USA)

Supervised Wireless Communication: An Analytic Framework for Real-Time Model Inference in the Core Network

Rekha Reddy (DFKI, Germany); Yorman Munoz and Christoph Lipps (German Research Center for Artificial Intelligence, Germany); Hans D. Schotten (University of Kaiserslautern, Germany)

Feature Management for Machine Learning Operation Pipelines in AI Native Networks

Gregor Cerar and Blaz Bertalanic (Jozef Stefan Institute, Slovenia); Mihael Mohorcic (Jozef Stefan Institute & Jozef Stefan International Postgraduate School, Slovenia); Marko Grobelnik and Carolina Fortuna (Jozef Stefan Institute, Slovenia)

Keynote 4

Visible Light Communications for 6G and Beyond

Prof. Murat Uysal

Time: Thursday, June 8, 2023 (10:45 - 11:30)

THURSDAY

Session 10: Internet of Things and Smart Applications

Time: Thursday, June 8, 2023 (11:45 – 13:15)

Chair: Pelin Angin (Middle East Technical University, Turkey)

Game Theoretic Analysis of Overtaking Maneuvers for Autonomous Vehicles with Moving Obstacles

Laura Crosara (Università degli Studi di Padova, Italy); Elvina Gindullina, Philip Dokkedal Leth, Jonathan Stouby Nielsen and Juan Baeza Ruiz-Henestrosa (University of Padova, Italy)

Status Update Scheduling in Remote Sensing Under Variable Delay

Leonardo Badia (Università degli Studi di Padova, Italy); Andrea Munari (German Aerospace Center (DLR), Germany)

Energy consumption optimization in a smart university campus microgrid

Galia Marinova (Technical University of Sofia, Bulgaria); Vassil Guliashki (Institute of Information Technologies - BAS, Bulgaria); Edmond Hajrizi (University for Business and Technology, Austria)

Digital Twin Middleware for Smart Farm IoT Networks

Lal Verda Cakir (Istanbul Technical University, Turkey); Tuğçe Bilen and Mehmet Ozdem (Turk Telekom, Turkey); Berk Canberk (Edinburgh Napier University, United Kingdom (Great Britain))

An Overview of Digital Twin Applications on Smart Agriculture

Manolya Atalay (Middle East Technical University, Turkey)

Keynote 5

On Some Quantum Internet Information Rates

Prof. Emina Soljanin

Time: Thursday, June 8, 2023 (14:15 - 15:00)

Session 11: Student Session

Time: Thursday, June 8, 2023 (15:15 – 16:45)

Chair: Bige Deniz Unluturk (Michigan State University, USA)

A method to improve the bandwidth of photovoltaic modules for LiFi applications

Carlos Iván del Valle Morales (Universidad Carlos III de Madrid & Optiva Media, Spain); Juan Carlos Torres Zafra (Universidad Carlos III de Madrid, Spain); Iñaki Martínez-Sarriegui (Optiva Media, Spain); Zhongcheng Yuan (University of Oxford, United Kingdom (Great Britain)); Henry Snaith (Clarendon Laboratory, University of Oxford, United Kingdom (Great Britain)); Alexandra Ramadan (University of Sheffield, United Kingdom (Great Britain)); Arnaud Walter, Xin-Yu Chin and Quentin Jeangros (CSEM, Switzerland); Randy Lozada Domínguez (Optiva Media, Spain); Jose M. Sánchez-Pena (Carlos III University of Madrid, Spain); Georgios Pekridis and Emmanouil Mylonakis (Eulambia Advanced Technologies, Greece); Dimitris Syvridis (National and Kapodistrian University of Athens, Greece)

Status Updates Against an Eavesdropping Node: a Game Theoretic Analysis

Laura Crosara (Università degli Studi di Padova, Italy); Nicola Laurenti (University of Padova & CNIT, Italy); Leonardo Badia (Università degli Studi di Padova, Italy)

Multiple DCLC Routing Algorithms for Ultra-Reliable and Time-Sensitive Applications

Piyush Navade (Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany)

Implementing TCP Cubic in Omnet++ INET Framework in IoST Environment

Ioannis Angelis (Ionian University & IONIO, Greece); Eleni Christopoulou and Konstantinos Oikonomou (Ionian University, Greece)

Session 12: Unconventional Communications and Computing

Time: Thursday, June 8, 2023 (17:00 – 18:15)

Chair: Murat Kuscü (Koc University, Turkey)

Organ(oid)-on-Chip Amplifies Diffusion Signals (invited paper)

Mitra Rezaei and Hamidreza Arjmandi (University of Warwick, United Kingdom (Great Britain)); Mohamad Zoofaghari (Yazd University, Iran); Kajsa Kanebratt, Liisa Vilen, David Janzen and Peter Gennemark (Astrazeneca, Sweden); Adam Noel (University of Warwick, United Kingdom (Great Britain))

Training Terahertz Wireless Systems to Battle I/Q Imbalance

Alexandros-Apostolos A Boulogeorgos (University of Western Macedonia, Greece & University of Piraeus, Greece); Angeliki Alexiou (University of Piraeus, Greece)

A Microfluidic Platform for Modeling Molecular Communications

Gokce Duzyol, Merve Gorkem Durmaz, Oguzhan Yetimoglu and Abdurrahman Dilmac (Bogazici University, Turkey); Zeliha Cansu Canbek Özdil (Yeditepe University, Turkey); Ali E. Pusane and Tuna Tugcu (Bogazici University, Turkey)

Can graph neural network-based detection mitigate the impact of hardware imperfections?

Lamprini Mitsiou and Stylianos E. Trevlakis (InnoCube, Greece); Argiris Tsiolas (University of Western Macedonia, Greece); Dimitrios J. Vergados (University of Western Macedonia & School of Electrical and Computer Engineering, National Technical University of Athens, Greece); Angelos Michalas (University of Western Macedonia, Greece); Alexandros-Apostolos A Boulogeorgos (University of Western Macedonia, Greece & University of Piraeus, Greece)