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ORGANIZER MESSAGE FOR THE 15TH SYMPOSIUM ON GREEN NETWORKING AND COMPUTING (SGNC 2024)

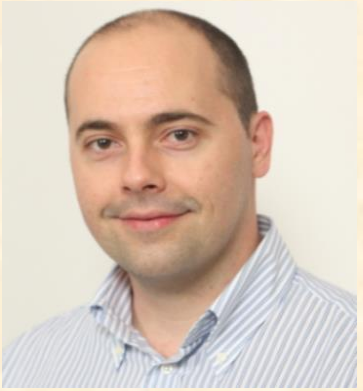
Foreword

I am pleased to present the Proceedings of the 15th Symposium on Green Networking and Computing (SGNC2024), a significant platform for advancing sustainable solutions in computing and networking. As technological advancements continue to reshape the digital landscape, the environmental implications of these innovations require focused attention and actionable solutions. This symposium aims to address these critical challenges by bringing together researchers, academics, and industry professionals to exchange ideas and share cutting-edge research.

The contributions presented at this year's symposium emphasize energy-efficient technologies, resource optimization, and innovative approaches for achieving sustainable development in information and communication technologies (ICT) and networking systems. The research showcased in these proceedings reflects the collective effort of the global community to minimize the environmental impact of ICT operations while maintaining system performance and reliability.

This Jubilee the 15th in a row Symposium on Green Networking and Computing (SGNC 2024) was organized in the frame of the 32nd International Conference on Software, Telecommunications and Computer Networks (SoftCOM 2024). The SGNC 2024 symposium was held on September 26-28, 2024, in Bol (island of Brač), Croatia. The organizer of the 15th Symposium on Green Networking and Computing (SGNC 2024) is the Faculty of electrical engineering, mechanical engineering and naval architecture (FESB) of the University of Split, Croatia. The SGNC 2024 symposium is organized in cooperation with the IEEE ComSoc Technical Committee on Green Communications and Computing (TCGCC) and with the support of the Croatian ACM chapter (CRO ACM). Also, the SGNC 2024 symposium hosted the final meeting of the EU Marie Skłodowska Curie Action (MSCA) Innovative Training Network (ITN) Greenedge project. In the frame of the 15th SGNC 2024 symposium, one keynote speech on the topic dedicated to the development of truly sustainable wireless communication systems was held, two papers were presented in the frame of the EU Greenedge project and five accepted papers were presented in the Special session on green networking and computing. Topics analyzed in the presented papers include sensor multiplexing in Linux containers for reduced energy and hardware usage, comparative evaluation of decision-making algorithms for energy and spectral efficiency trade-offs in Massive MIMO systems, the application of smart street lighting communication system for urban energy optimization, power savings of device-to-device communication in 5G networks, machine learning-based prediction of power usage effectiveness in data centers, energy-aware image classification, and efficient IoT network strategies for enhanced sustainability.

The papers included in the SGNC2024 proceedings span a diverse range of cutting-edge research and practical applications, all united by a shared goal of achieving greener technologies. They underscore the importance of collaboration across domains to tackle complex challenges and drive the progress of global communication networks and systems toward energy-efficient and environmentally sustainable mitigation. I express my heartfelt gratitude to the authors, reviewers, and international symposium committee members who contributed to making SGNC2024 a success. Your dedication and collaboration have significantly enriched this year's symposium and strengthened its commitment to green networking and computing. I hope that these proceedings will serve as a valuable resource for researchers, professionals, and policymakers seeking to deepen their understanding of the topic dedicated to green networking and computing and inspire further research and innovation in this crucial field.



Editor

Josip Lorincz, PhD

PROCEEDINGS INFORMATION

Proceedings of the 15th Symposium on green networking and computing 2024 (SGNC 2024)
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INTERNATIONAL SYMPOSIUM COMMITTEE

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SYMPOSIUM PROGRAM

SS4 – PhD student contest of the EU Greenedge project
Special session chair: *Michele Rossi (Politecnico di Torino, Italy)*
September 27, 2024, 16:30 – 18:00, Conference room Korčula

SS4 – Special session on Green Networking and Computing
Session chair: *Josip Lorincz, Ph. D., FESB, University of Split, Croatia*
September 27, 2024, 14:30 – 16:00, Conference room Korčula

Tracks

- *Keynote Speech*
- *PhD student contest of the EU Greenedge project*
- *Special Session on Green Networking and Computing*

Keynote Speech

Keynote speech title: Towards Truly Sustainable Wireless Communication Systems

September 27, 2024, 09:30-11:00, Conference room Korčula

Marcos Katz, PhD
University of Oulu, Finland

Abstract: The current development of 6G is focused on creating communication and computing systems with unprecedented performance levels. Moreover, the development is also considering, more than ever before, the costs associated with such systems, in terms of consumption of resources. Sustainability is one key aspect of 6G systems, and in this presentation 6G sustainability will be approached from a wide perspective, taking into account resource utilization well beyond the conventional energy cases. This will allow minimizing the overall resource consumption and therefore, developing a truly sustainable system. A holistic approach to sustainability will be discussed, considering measures to improve sustainability at different stages of a 6G system, from design to end-of-life. Finally, a concrete example of the holistic approach towards truly sustainable 6G systems will be presented and discussed.

Biography:
Marcos Katz (marcos.katz@oulu.fi) is a professor at the Centre for Wireless Communications, University of Oulu, Finland, since Dec. 2009. He received the MS degree in Electrical Engineering from Universidad Nacional de Tucumán, Argentina in 1987, and the MS and Dr. Tech. degrees in Electrical Engineering from the University of Oulu, Finland, in 1995 and 2002, respectively. He worked in different R&D positions at Nokia, Finland between 1987 and 2001. In 2001–2002 he was a Research Scientist at the Centre for Wireless Communications, University of Oulu. In years 2003–2005 Dr. Katz was the Principal Engineer at Samsung Electronics, Advanced Research Lab., Telecommunications R&D Center, Suwon, Korea. From 2006 to 2009 he worked as a Chief Research Scientist at VTT, the Technical Research Centre of Finland. Prof. Katz served as the chair of Working Group 5 (on short-range communications) for the Wireless World Research Forum (WWRF) in 2008-2012. Prof. Katz has written and edited six books in different areas of mobile and wireless communications. He has written more than 200 publications and holds more than 50 patents. Prof. Katz is a member of the 6G Flagship research program, and his current research interests include optical wireless communications, sustainable wireless connectivity approaches for 6G as well as open 6G architectures.

SS4 –Greenedge project PhD student contest

- **Energy Aware Image Classification**
Andrea Scanu, Luca Vergolani (University of Padova) - Greenedge project challenge

- **Energy Efficient IoT Networks**
Mohammad Khalili (University of OULU) - Greenedge project challenge

- **Greenedge challenge project awards** (Greenedge project members)

SS4 – Special Session on Green Networking and Computing

Special session organizer: *Josip Lorincz (University of Split, Croatia)*
Special session chair: *Josip Lorincz (University of Split, Croatia)*

❑ **Sensor Multiplexing in Linux Containers**
Peter Barth (University of Applied Sciences Mannheim & University of Applied Sciences, Germany); Raphael Barth (Titum GmbH, Germany)

❑ **Comparison of Multi-Criteria Decision-Making Algorithms for Spectral and Energy Efficiency Trade-off in Massive MIMO Systems**
Eni Haxhiraj and Elson Agastra (Polytechnic University of Tirana, Albania); Desar Shahu (Polytechnic University of Tirana & Faculty of Information Technology, Albania)

❑ **Smart Street Lighting for Enhancing Energy Efficiency in Urban Environments**
Visnja Krizanovic (University of Osijek, Croatia); Ana Pejkovic (Josipa Kozarca 51, Croatia); Patrik Pracny (University of Osijek, Croatia)

❑ **Power Savings of Device-to-Device (D2D) Communication System Using Several Bands 5G Underlaying Cellular Networks**
Razan A. Shatnawi, Mahmoud A. Khodeir and Mamoun F. Al-Mistarihi (Jordan University of Science and Technology, Jordan); Khalid A. Darabkh (The University of Jordan, Jordan)

❑ **Data-Driven Prediction of Power Usage Effectiveness: A Machine Learning Case Study**
Besjana Muraku and Alba Haveriku (Polytechnic University of Tirana, Albania); Aneta Deliu (UPT, Albania); Elinda Kajo Mece (Polytechnic University of Tirana, Albania)

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