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COMSOC CONFERENCE

IEEE International Conference on Communications (ICC), Rome, Italy, 2023

by Marco Ajmone Marsan, Marco Luise, General Co-Chairs, and Roberto Verdone, Executive Chair, Italy

As the readers of Communications Magazine well know, the IEEE International Conference on Communications (ICC) stands the oldest, largest and most significant international conference in the field of telecommunications. ICC, together with GLOBECOM, is the "flagship" event of the IEEE Communications Society.

This year, ICC reached its 58thannual edition, and for the first time ever has come to Italy, heralding the activity of a large and well-structured community working in the diverse fields of communication theory and technologies in Academia, in research Institutions, in companies. ICC 2023 took place from May 28 to June 01, in Rome, the historic capital of Italy.

The bid to host the conference was submitted in 2017, and at that time the Organizing Committee started planning for a "normal" edition of the conference, with the few changes necessary to adapt to the Italian environment, as well as to allow attendees to enjoy their trip to Rome — no one could guess what the future had in stock for all of us, i.e., the COVID-19 pandemic. Once conference organization entered its truly active phase, i.e., after the start of 2020, the Organizing Committee that we had the pleasure to coordinate had to plan and revise, and re-plan and revise again, considering all of the possible hypotheses and all of the possible combinations in terms of virtual, mixed, or in-presence format of the event. This also meant looking for spaces of variable capacities to accommodate different numbers of in-presence attendees. Finally, it became clear that, after some virtual and hybrid conference editions, ICC 2023 would have been the first post-pandemic instance ofthe ICC/GLOBECOM series with a completely in-person program, and we set our target to 2000 in-presence attendees.

Ultimately, we welcomed in Rome almost 2500 attendees, who could directly interact with colleagues, participate in a vibrant technical program, and enjoy the very many attractions of the city, with its world-famous museums, landmark architecture, Italian-style fashion and cuisine. The ICC 2023 attendees had an opportunity to visit some of the most iconic locations in the world: the Trevi Fountain, the Colosseum, the Spanish Steps, St. Peter's Square, Piazza Navona, just to mention a few of the town's jewels.

Returning to the normality of an in-person conference was a long-awaited opportunity for attendees to meet old friends and discuss face-to-face ongoing research projects, plan future collaborations, share ideas and information, and contribute to accelerate innovation by spreading the latest research results on communications and networking around the world.

The ICC 2023 Technical Program Committee set up an outstanding scientific program comprising over one thousand papers organized in thirteen Symposia, over three hundred contributions collected in twenty-four Workshops, and thirty-four Tutorial presentations, topped by nine keynote speeches by leading industry experts, by world class academics, and by the 2023 IEEE Eric E. Sumner award recipient. In addition to scientific presentations, ICC 2023 also featured a robust Industrial program, with key experts from leading companies presenting and debating the latest technological advances. More on the technical content of the conference can be found in the dedicated Conference Column Report in this same issue of the Magazine.

Night view of the Conference Center "La Nuvola"

Plenary session in the huge auditorium of La Nuvola

The conference's focal point was "Sustainable Communications for Renaissance," drawing inspiration from the historical Renaissance of Arts that unfolded during the 15th and 16thcenturies in Italy, witnessing significant advancements in science and art, with visionary thinkers like Leonardo Da Vinci. ICC 2023 reflected on the post-pandemic era, considering the pivotal role of telecommunications in enabling people to carry on their activities remotely during lockdown periods, but also in paving the way towards new habits and ways of living, working, and teaching that will remain with us after returning to normality — a very strong indication of the unrivaled significance of telecommunications in shaping the world's future.

Rome provided the ICC community an exceptional conference location: the La Nuvola ("The Cloud") conference center, one of the most iconic buildings in the entire city of Rome. Inaugurated in 2016, this masterpiece by architect Massimiliano Fuksas is an exceptional work of art, featuring innovative structural solutions, an eco-friendly approach, and the use of technologically advanced materials — the ideal venue for a conference that placed technology and sustainability at its core! The scientific and industrial sessions were complemented by a lively, large exhibition area with over 30 booths by companies, publishers, research initiatives, showcasing their latest technologies and activities.

Organizing an event as complex as ICC is not a feat that can be accomplished by single albeit active persons — what actually matters is building and motivating an efficient team of dedicated organizers. The Organizing Committee of ICC 2023 was top-grade: we just men-

tion here our Vice-Chair Luca Sanguinetti, our distinguished Technical Co-Chairs, Meixia Tao and Michele Zorzi, and our Industrial Forum & Exhibition Chair Roberto Sabella, only because we cannot mention all of the many persons that actively contributed to the organization and success of the event — just a special thanks goes to our ComSoc project manager Melissa Torres. We acknowledge the tremendous effort of our TPC Chairs to manage the huge task of reviewing about 2,500 submitted papers, as well as of our Finance Chair, Web Chairs and Publication Chairs, who brought their professionalism into the loop. We wish to also mention the competenceof the company First Class Events and Conferences, the ICC 2023 PCO, that very effectively supported us along all the steps of the conference organization.

But, the core of a conference is made by of all paper authors, keynote speakers, presenters, paper reviewers, session chairs, and volunteers, whose contributions and commitment ensured that the quality of this edition met the highest ComSoc standards. The precious support received by all the patrons (Huawei, Intel, Keysight, Qualcomm, TII, ZTE, Ericsson, NEC, Leonardo, Barilla, SensorID), as well as by the exhibitors, was an invaluable contribution to the conference organization and to the creation of the "ICC flavor" that all the 2433 registered visitors were able to appreciate.

ICC2023 has also honored the achievements of IEEE and IEEE Communications Society members with a number of awards presented during a dedicated ceremony. In addition to the conference Best Paper Awards, the Society's major paper awards recognized outstanding and original papers published in IEEE ComSoc journals and magazines, that essentially enlarged the field of communications engineering. They opened new lines of research, envisioned bold approaches to communication, and formulated new problems to solve. The outstanding contribution of distinguished researchers to the advancement of the community's activities was also acknowledged. Awards recipients discovered, extended, or complemented technological advancements in education, industry, research, and service.

The participants to ICC 2023 enjoyed a superb program of social events, culminated into the conference banquet at the magnificent "Villa Miani". The garden of the Villa hosted a welcoming cocktail on a hill overlooking the whole town and the dome of S. Peter's church at sunset: a view that the 900 attendees and their guests will surely remember.

Attendees enjoying the welcome cocktail and the wonderful view of Roma from the hill garden of the magnificent Villa Miani before the banquet.

Presenting papers at an Interactive Session in the Exhibit Hall.

Organizing the conference required a lot of work and a lot of patience, but ... we are flattered when people we meet around the world tell us how much they enjoyed coming to Rome for ICC 2023.

TCS CONFERENCE

The 31st International Conference on Software, Telecommunications and Computer Networks (SoftCOM 2023)

Tradition in Connecting Academy and Industry

by Dinko Begusic, Josko Radic, Matko Saric, Katarina Rados, Marta Brkic, Croatia; Sinisa Krajnovic, McKinsey & Company, Pascal Lorenz, France; Joel J. P. C. Rodrigues, Portugal

The 31st International Conference on Software, Telecommunications and Computer Networks — SoftCOM 2023 was held in Amphora hotel Split, Croatia, 21 to 23 September, 2023. The Conference has been technically co-sponsored by the IEEE Communications Society (ComSoc) with the support of the Technical Committee on Communications Software (CommSoft) and the IEEE Croatian Section. The Conference was organized by the University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture (FESB) and Croatian Communications and Information Society (CCIS) under the auspices of the Croatian Academy of Engineering.

31st SoftCOM conference extends the tradition of gathering academy and industry to joint the efforts in order to advance the science, technology and education in the area of ICT. A number of academic and industrial partners, as well as public institutions joined the collaboration and took parti in this endeavour. Attractive ambiance of the city of Split and Adriatic sea coast has been a perfect location for such a meeting.

The technical program featured seventeen conference sessions, including eight special sessions dedicated to: QoS in Wired and Wireless Networks, Ad Hoc & Sensor Networks, and Internet of Things, Green Networking and Computing, Security and Digital Forensics, Smart Environments and IoT, Advances in Data Analytics, Robotics and ICT Assisted Wellbeing, Environmental Electromagnetic Compatibility, and Advanced Educational Technologies. Three half day tutorials in the area of electromagnetics have been held by recognized experts. The interdicsiplinary Symposium on Information Security and Intellectual Property has been organized in collaboration with the University of Split, Faculty of law, and the University of Zagreb Faculty of electrical engineering and computing. The authors of selected papers have been invited to extend their papers and submit the for publication in the Journal of Communications Software and Systems (JCOMSS).

The plenary session was chaired by prof. Dinko Begusic,University of Split, prof. Maja Matijasevic, University of Zagreb, and prof. Pascal Lorenz, Universite de Haute Alsace, France.

The keynote talk titled: "Server Selection in the Internet Continuum" was given by professor emeritus Marco Ajmone Marsan, MDEA Networks Institute, Spain / Politecnico di Torino, Italy, The speaker shared his perspective and experiences on the strategies for the selection of the server in the edge computing environment taking into account a set of relevant parameters. The invited talk

titled "High-Baudrate SiP and InP Modulators for Data Center Interconnects" was presented by Oskars Ozolins, Research Institutes of Sweden (RISE AB), Sweden, Riga Technical University, University of Riga, Latvia. The speaker presented the recent research on the fast modulators technologies aimed to increase the speed of data tramsmission in data centers and thus enable more efficient overall design.

At the beginning of the plenary session a minute of silence for the deceased professor emeritus Nikola Rozic, one of the founders of the SoftCOM conference, has been held. As a part of the opening ceremony the audience has been addressed by prof. Branimir Lela, Dean of the Faculty of electrical engineering, mechanical engineering and naval architecture (FESB), prof. Pascal Lorenz, University of Upper Alsace, France, prof. Mario Kusek, IEEE Croatia Section Conference Coordinator, Faculty of electrical engineering and computing, University of Zagreb, Milan Zivkovic, Director, Strategy and Business Development, Ericsson Nikola Tesla company.

The accompanying SoftCOM 2023 Business Forum featured professional workshops, project presentations and panel discussions with participation of experts and institution representatives. 29th Workshop on ICT featured a set of presentations of professional papers and posters in the area of ICT.

Panel discussion "Digital Transformation – the Rise of EDIHs" was coordinated by professor Nedjeljko Peri?, University of Zagreb and moderated by Ivana Vuka, Head of the Technology transfer office of the University of Split with participation of the representatives of European Digital Innovation Hubs (EDIHs). The panel discussion was endorsed of the Ministry economy and sustainable development of the Republic of Croatia. Panel discussion "AI From University to Local IT" was moderated by Damir Br?i?, Head of the Digital Dalmatia, County of Splitsko and Dalmatia. The panel discussion was focused on the collaboration between the academic institutions and the local community in AI education.

Workshop on Development of Optical Communication Networks was moderated by Damir Bre?kovic, Ph.D., Access network strategy and Planning Department, Croatian Telekom. The workshop has been endorsed by HAKOM (Croatian Regulatory Authority for Network Industries).

The welcome party was organized in the City of Split Port – visiting sailing club Labud.. The conference trip included a guided tour of Olive museum and the storytelling walk around the historic fortress of Klis.

The presentation of the project VITA (Virtual Telemedicine Assistance) was organized by profesor Mladen Russo, FESB Split. The project is aimed to development of the collaborative telemedicine platform and it is cosponsored by European Regional Development Fund — the Competitiveness and Cohesion Operational Program.

A special part of the program was aimed to master level students. Ericsson Nikola Tesla Summer Camp 2023 Workshop featured the presentatiosn of seven students projects completed within the summer camp. The 12th Workshop on Software Engineering in Practice included ten students presentations of software development technologies. The workshops have been moderated by Darko Huljeni?, Ph.D., Ericsson Nikola Tesla, Croatia.

More information about the SoftCOM 2023 conference may be found at the address https://2023.softcom.fesb.unist.hr/

CHAPTER NEWS

IEEE ComSoc Karachi Chapter

Industrial Visit at Pakistan Telecommunication Company Limited, Gul Centre Exchange, Hyderabad, Pakistan

by Umair Ahmed Korai, MUET, Vice Chair IEEE ComSoc Karachi Chapter, Pakistan

IEEE Communication Society (ComSoc) Karachi Chapter in collaboration with IEEE ComSoc Mehran University of Engineering and Technology (MUET) Student Chapter and IEEE Industrial Electronics Society Karachi Chapter organized an Industrial visit at "Pakistan Telecommunication Company Limited (PTCL), Gul Centre Exchange, Hyderabad Pakistan" on July 15, 2023.

The total number of participants in this industrial visit was 32 and all were IEEE members. Participants were from diverse backgrounds and disciplines, including Telecommunication Engineering, Electrical Engineering, Electronics Engineering, Mechatronics Engineering, Information Technology, and Business Management. The Industrial visit at PTCL was organized to provide students and professionals members with an opportunity to gain insights into the workings of one of Pakistan's leading telecommunication companies. The event aimed to enhance participants' understanding of PTCL's infrastructure, technological advancements, and its role in shaping the telecommunication landscape of the country.

The event started with following schedule:

- Welcome and Registration: The event commenced with a warm welcome to all participants, followed by registration to ensure a smooth and organized experience.
- Introduction to PTCL: An introductory presentation was delivered by PTCL representatives, providing an overview of the company's history, milestones, and its current position in the telecommunications sector.
- Network Operations Center (NOC) Visit: Participants were taken to PTCL's Network Operations Center, where they witnessed the real-time monitoring and management of PTCL's vast network infrastructure.
- Data Centres: The visit proceeded to the Data Centres, where PTCL showcased its state-of-the-art facilities, including server rooms, cooling systems, and data security measures.
- Technology Demonstrations: PTCL experts demonstrated the latest telecommunications technologies, including fibre optic networks, 5G infrastructure, and cloud-based services.
- Q&A Session: A dedicated question and answer session allowed participants to clarify their doubts and gain deeper insights into PTCL's operations.

IEEE Members visiting different departments of PTCL Gul Centre Exchange including Broadband, Fiber Optics, and Generators.

Key Takeaways:

- Advanced Infrastructure: Participants were impressed by PTCL's advanced telecommunications infrastructure, including its extensive fiber optic network and cutting-edge data centers.
- Technological Advancements: The demonstrations of 5G technology and cloud-based services showcased PTCL's commitment to staying at the forefront of technological innovations in the industry.
- Network Management: The visit to the Network Operations Center highlighted the company's proactive approach to network monitoring and management, ensuring uninterrupted services for its customers.
- Industry Exposure: Students and professionals appreciated the firsthand exposure to the telecommunication industry, which provided them with valuable insights for their academic and professional growth.

The Industrial visit at PTCL proved to be an enriching and enlightening experience for all participants. It provided them with valuable insights into the operations of a leading telecommunication company, its technological advancements, and its pivotal role in shaping Pakistan's digital landscape. The event fostered networking opportunities and left participants inspired to pursue excellence in their respective fields.

In the end, souvenirs were distributed to PTCL team from IEEE ComSoc Karachi Chapter, certificates were distributed to participants, and a lunch was organized at KFC Thandi Sarak, Hyderabad for all the participants, volunteers, and organizers.

CHAPTER NEWS

A Skill Development & Training Workshop on 5G Cellular Systems at the ComSoc Delhi Chapter, India

by Vivek Ashok Bohara, Chair of the IEEE ComSoc Delhi Chapter, India

The Department of ECE, Indraprastha Institute of Information Technology, Delhi (IIIT-Delhi) conducted a 2-week skill development and training workshop on the Design and Fundamentals of 5G and Beyond 5G cellular systems. The workshop was technically sponsored by IEEE Communication Society, Delhi Chapter, Keysight Technologies, Anritsu, and Entuple Technologies. This workshop shared insights on the indigenous design and development of 5G equipment in India as well as standardization efforts taken by Indian academic institutions and companies in this direction. This workshop aim was to enhance employability of the faculty, students and industry professionals in the telecommunication and allied domains with specific focus on 5G system design, fundamentals, and performance analysis. All workshops were designed to meet National Skill Qualification Framework (NKQF) level 5 and above. The workshop offered unique balance between the theory and hands-on lab experiments with 50 fast- paced contact hours.

The first week was started with a warm welcome from the Organizing Committee, including Prof. Vivek Ashok Bohara, Head, the Department of ECE at IIIT-Delhi as well as Chair, IEEE Communication Society Delhi Chapter. This was followed by an introduction and overview by Dr. Sumit J. Darak, Associate Professor, IIIT-Delhi. The workshop was attended by around 80 participants.

A group photograph after the valedictory function.

The workshop covered both theoretical presentations and practical demonstrations each day for two weeks. The theoretical presentations were offered by the well-known speakers from academia as well as industry and the practical demonstrations were conducted by research engineers and Ph.D. scholars. The speakers from academics were Dr. Gourab Ghatak, Assistant Professor at IIT Delhi who gave a presentation on Initial-Access Design and Beam-Acquisition in 5G, Dr. Abhijit Mitra, Assistant Professor at IIIT-Delhi who introduced 5G Transport Network Infrastructure, Prof. Vivek Ashok Bohara, Professor at IIIT-Delhi presented and discussed Vehicular-visible light communication for 5G and beyond 5G V2X Communication, Dr. Arani Bhattacharya, Assistant Professor at IIIT-Delhi gave a talk on Utilization of MIMO in Modern Wi-Fi Systems, Dr. Sumit Darak, Associate Professor at IIIT-Delhi discussed on Multi-armed Bandit- based Online Learning for 6G: From Algorithms to Architecture.

The list of industrial speakers include Mr. Sudipta Bhaumik, from Sterlite Technologies presented on Advancement in fiber optics technologies for 5G and beyond, Dr. Parag Aggarwal, 5G System Architect at HFCL Ltd. discussed RU Design Fundamental for 5G systems and 5 G Standards (3GPP & ORAN), Mr. Madhukar Tripathi, Associate Director- Business Development & Marketing at Anritsu India Pvt. Ltd. Presented on 5G optical measurements, Dr. Mansi Peer, Staff Software Engineer at National Instruments, talked on 5G Test and Measurement, Mr. Asheesh Sharma, Engineer-Technical Support at Anritsu India Pvt. Ltd. presented on 5G base station measurements, Mr. Rupam Anand, Expert R&D at Keysight Technologies presented on 5G beamforming.

This workshop was unique in the sense that each talk was followed by practical lab sessions which gave the participants hands on experience on some of the current 5G technologies and systems as well as test and measurement required in the domain of 5G cellular systems. The first lab session was addressed by Dr. Rahul Gupta, Manager of Research Labs at IIIT-Delhi on 5G measurements using spectrum analyser. Subsequently, other sessions were presented by Ph.D. students from Wirocomm and CoE-LiFi Labs at IIIT- Delhi. The sessions were open to all workshop attendees and students. The participants' feedback was very positive and they appreciated the initiative taken by the IEEE ComSoc Delhi Chapter and ECE department of IIIT-Delhi.

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Stefano Bregni
Editor-in-Chief
Politecnico di Milano, Italy
Email: bregni@elet.polimi.it

Fabrizio Granelli
Associate Editor
University of Trento, Italy
Email: fabrizio.granelli@unitn.it

IEEE Communications Society — Member and Global Activities
Ana Garcia-Armada, Vice-President for Member and Global Activities
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Periklis Chatzimisios, Chair of the YP Standing Committee

Regional Correspondents Who Contributed to This Issue
Ewell Tan, Singapore <ewell.tan@ieee.org>
Luis Correia, GIMS Chair, Portugal
<luis.m.correia@tecnico.ulisboa.pt>

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