



Horizon 2020 Program

WIDESPREAD-03-2018-TWINNING

Innovation and excellence in massive-scale communications and information processing

INCOMING (Project No. 856967)

D6.3: Networking, dissemination and outreach activities including the event list: Year 3¹

Abstract: This document presents a report on the 3rd year and extension period networking, dissemination and outreach activities of INCOMING project.

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List of Abbreviations

AAU	Aalborg University
CHALMERS	Chalmers University of Technology
COVID	Corona Virus Disease
DLR	German Aerospace Centre
ER	Experienced Researcher
ESR	Early Stage Researcher
EU	European Union
FTN	Faculty of Technical Sciences, University of Novi Sad
ICT	Information and Communication Technologies
IEEE	Institute of Electrical and Electronic Engineers
SCI	Science Citation Index
SEE	South Eastern Europe
UNS	University of Novi Sad
WP	Work Package

Executive Summary

The main purpose of networking, dissemination and outreach activities is to promote INCOMING project results to a wider community, to increase presence of ICONIC researchers at flagship conferences in the field, to enhance networking channels of ICONIC researchers via EU partners, etc. In this deliverable, we describe in detail the networking, dissemination and outreach activities done during the third project year and extension period of H2020 INCOMING. Among the most important events, we emphasize a successful organization of two special sessions: BalkanCom 2022 conference in Sarajevo and EUSIPCO 2022 conference in Belgrade. The special session moved on in-person collaboration between INCOMING partners which gradually became possible due to progressive of travel restrictions imposed during the COVID-19 pandemic.

1 Introduction

H2020 INCOMING project aims to promote research and innovation results of ICONIC centre (Faculty of Technical Sciences, University of Novi Sad) and spread excellence in local and regional domain. These activities within the project are mainly guided by Work Package WP6, which is dedicated to networking, dissemination and outreach. The main goals of WP6 are listed as follows:

- To promote ICONIC centre as a regional lighthouse in terms of research excellence and innovation capacity in the domain of 5G technology, services and applications
- To gain visibility and attract stakeholders through networking, dissemination and outreach activities of 5G Innovation and Technology Hub
- To make strong partnership and sustainable cooperation within the consortium and expand network of connections outside of consortium through the project networking events (brainstorming weeks, workshops and special sessions)
- To present project research and innovation results at high-impact conferences
- To identify target domains, prepare and coordinate proposal writing process for future joint projects with consortium partners.

The twinning methodology in the domain of networking and dissemination is divided into two main components: 1) research-oriented networking *internal to the project*, and 2) research-oriented networking, dissemination and outreach *towards wider community*. The main research-oriented networking and dissemination mechanisms are listed below (see D6.1 for more details):

- **Brain-storming weeks:** The brain-storming weeks represent the main internal research-oriented networking and dissemination event. The goal of the brain-storming week is to gather as many senior researchers from project partners to a single location to a week-long event where they would work together and share ideas within small, topic-based groups.
- **Workshops and special sessions:** The main form of research-oriented networking and dissemination towards wider community will be in the form of workshops and special sessions collocated with international conferences or similar events in the domain of 5G communication systems, machine learning and information processing.
- **Dissemination and outreach at global and regional events:** Research and implementation results produced during the project lifetime will be presented at major conferences by all members of the consortia. ICONIC staff members will also promote ICONIC centre and INCOMING project at relevant regional events.

The primary objective of networking and dissemination is to promote project outcomes to a broader community, to boost the visibility of ICONIC researchers at leading conferences within the field, etc. In the following, we describe the activities done during the third project year and extension period. We note that, due to COVID-19 pandemic, the original plan had to be significantly revised in order to make the activities possible under new circumstances.

2 Brainstorming Weeks and Final Event

After the Kick-off meeting and the 1st Brainstorming Week at the beginning of the H2020 project INCOMING, the widespread COVID-19 travel restrictions resulted of the absence of the Brainstorming Week events during the second year of the Project. Finally, after liberation of the COVID-19 travel restrictions, it was possible to plan a physical organisation of two Brainstorming Week events during the project extension period. Brainstorming Weeks were organized to bring together the core research team: the scientists in charge and senior researchers from all four partner institutions at a single location where they would collaborate in an informal atmosphere.

The second Brainstorming Week

The second Brainstorming Week was organized by DLR on January 23-26 2023 as a part of the workshop on communication theory, channel coding and other related topics. The event was held at the Environmental Research Station Schneefernerhaus, located just below the summit of Zugspitze, Germany's highest mountain.

After the workshop technical program, the rest of the days has been allocated to the 2st Brainstorming Week. The event had a format of an informal workshop with representatives of all four involved institutions presenting their recent research results. The first day of event started by an overview presentation about 2020 INCOMING project and ICONIC centre R&D activities, which was followed by brainstorming session. Next two days were dedicated to presentation of the participants' recent research results and research interests and possibilities for future collaboration within the INCOMING project.

Besides researchers from the INCOMING project partner institutions, the second day of event included presentation of invited guests Prof. Jean Marie Gorce, from INSA-Lyon, France, and Prof. Leonardo Badia, from University of Padova, Italy. The joint photo of participants from the event is presented below, as well as event agenda (<http://zugspitzeworkshop.com/>).

Report on the 2023 INCOMING Zugspitze Workshop on Communications appeared in March issue of IEEE Information Theory Society newsletter. You can read the whole text at the link <https://www.itsoc.org/newsletter/article/2023-zugspitze-workshop-communications>.



Figure 1. 2nd Brainstorming week, Zugspitze, Germany, January 23-26 2023.

Technical Program		
Monday 23.01.2023		
15:30 - 16:30	H2020 INCOMING project and ICONIC centre R&D activities	Dejan Vukobratovic
16:30 - 19:00	Brainstorming	
20:00	Dinner	
Tuesday 24.01.2023		
09:30 - 10:10	On Autoencoder-Based Error Correcting Codes	Vukan Ninkovic
10:10 - 10:50	Known Limits, Achievability and Trends for M2M: Towards Massive, Reliable and Real-Time Communications	Jean Marie Gorce
10:50 - 11:20	Coffee Break	
11:20 - 12:00	Game theoretic analysis of age of information for slotted ALOHA access with capture	Leonardo Badia
12:00 - 14:00	Lunch Break	
14:00 - 14:40	Graph Neural Networks on Factor Graphs: Tutorial Overview and Applications in Power Systems	Ognjen Kundacina
14:40 - 15:20	Unsources Multiple Access with Common Alarm Messages: Network Slicing for Massive and Critical IoT	Khac-Hoang Ngo
15:20 - 15:50	Coffee Break	
15:50 - 16:30	Error Detection Strategies for CRC-Concatenated Polar Codes under Successive Cancellation List Decoding	Alexander Sauter
16:30 - 19:00	Brainstorming	
20:00	Dinner	
Wednesday 25.01.2023		
09:30 - 10:10	On the Value of Retransmissions for Age of Information in Random Access Networks without Feedback	Andrea Munari
10:10 - 10:50	Radio Access in 5G and Beyond with Integrated Terrestrial and Space Networks	Isreal Leyva-Mayorga
10:50 - 11:20	Coffee Break	
11:20 - 12:00	Design and Analysis of Hybrid OWC/RF Massive IoT Networks	Milica Petkovic and Tijana Devaja
12:00 - 14:00	Lunch Break	
14:00 - 14:40	On tailoring Deep Learning techniques: Deep Q-Routing	Manuel Roth
14:40 - 15:20	Distributed Inference in Large-Scale Linear Models using Alternating Gaussian Belief Propagation	Dejan Vukobratovic
15:20 - 15:50	Coffee Break	
15:50 - 16:30	Rate-Adaptive Protograph MacKay-Neal Codes	Ayman Zahr
16:30 - 19:00	Brainstorming	
20:00	Dinner	

Table 1. Workshop and the 2nd Brainstorming week agenda.

The third Brainstorming Week

The final Brainstorming Week was organized by AAU on August 23-25 2023. The event was held at the Aalborg University campus in Copenhagen, Denmark. During this event, besides discussing the current research activities and future project proposal, participants from all INCOMING project institution were devoted to looking beyond the project lifetime into the future collaboration opportunities. One part of the Brainstorming event was devoted to train ESRs of the project on EU HORIZON EUROPE projects and possibility for future collaboration within EU researchers.

The joint photo of participants from the event is presented in Figure 2. The brainstorming week agenda is presented in Table 2, with more details on the program of each meeting day.



Figure 2. 3rd Brainstorming week, Copenhagen, Denmark, August 23-25 2023.

Location: Aalborg University, A. C. Meyers Vænge 15, 2450 Copenhagen, Denmark

Date:	Wednesday, August 23 rd	Thursday, August 24 th	Friday, August 25 th
Room:	2.1.021	2.1.025	2.1.025
9:30 – 10:30	/	FTN: Overview of potential future research collaboration topics	Strahinja Dosen, Center for Sensory-Motor Interaction, AAU: Semi-autonomous connected assistive robots
10:30 – 11:00	/	Coffee break	Coffee break
11:00 – 12:00	/	AAU, DLR, & Chalmers: Overview of potential future research collaboration topics	Dejan Vukobratovic, FTN, Novi Sad: ML/AI Integration in Beyond 5G
12:00 – 13:30	Lunch	Lunch	Lunch
13:30 – 14:30	Cedomir Stefanovic: Overview of some recent results on tree algorithms	FTN: Overview of coming calls/funding opportunities	/
14:30 – 15:00	Coffee break	Coffee break	/
15:00 – 16:00	Estefania Recayte, DLR: Per-Replica Power Diversity in Modern Random Access Schemes	All: Workshop – writing 1-pagers for potential proposal(s)	/
Social event	20:15 – 23:15 Dinner at Bæst pizza Guldbergsgade 29, 2200 København	TBD	

Table 2. Brainstorming week agenda, Workshop and the 2nd.

Final Event of the INCOMING Project

H2020 project INCOMING ends on the 01st of October 2023. Final event has been organized during the last month of the project on September 19-20 2023.

During final event, all participants had an opportunity to meet the details of H2020 INCOMING project, the results and established collaborations. The final outreach event of H2020 INCOMING project was divided into two main parts:

- 1) **The first day of event:** *INCOMING Project, ICONIC Center and Future of ICONIC*, held in Novi Sad, University of Novi Sad, Science and Technology Park, on the 19th September 2023.
- 2) **The second day of event:** *Keynote Talks on the Path towards 6G*, held in Belgrade, Hotel Crowne Plaza Belgrade, on the 20th September 2023.

The first day of event proceeded with overview of ICONIC centre and its growth and benefits under INCOMING project. The session about next steps followed up, where scientists in charge from all three partner institutions and representatives of ICONIC centre provides current and further activities. The last session of the first day was dedicated to main results and achievements during INCOMING project duration. Results are presented in the form of poster session, which involved both WP2 and WP3 research and development topics of the INCOMING project, as well as some active EU and national projects that involve INCONIC staff members. Participants of event had an opportunity to visit poster presentation, while being introduced with future research and development topics and career steps of the ICONIC staff members. List of all poster presenters can be found in Table 3.



Figure 3. Prof. Dejan Vukobratovic (UNS/ICONIC) opens the Final event of the H2020 INCOMING project.

The second day of event was dedicated to keynote talks on the Path towards 6G. Keynote presenters were renowned leading experts on the topic of 6G topic: Prof. Petar Popovski (Aalborg University, Denmark), Ivan Seskar (Rutgers University, USA), Prof. Haris Gacanin (RQTH Aachen University, Germany), Prof. David Gomez Barquero (Polytechnic University of Valencia, Spain), Konstantinos Chalkiotis (Deutsche Telekom, Germany), Prof. Robert Stewart (Strathclyde University, UK). Keynote presentations were followed by panel discussion on the development of

next generation of communication systems, which gave an opportunity for interactive discussion on the 6G topic between keynotes and participants of the meeting.

Final meeting was attended by most of the ICONIC staff members as well as numerous representatives from 3 project partner institutions. Besides, the representatives from regional communication industry holders were present, as well as researchers from other Universities in Serbia. The final event gave an opportunity to promote research and innovation results of ICONIC centre, but also to spread excellence in local and regional domain and make an initial step for further collaboration between regional and international academic and industry attendees.

The Final Event agenda is presented in Table 3, with more details on the program of each meeting day.



Figure 4. Final event, the 1st day, Novi Sad, Serbia, September 2023.



Figure 5. Final event, the 1st day, Poster session, Novi Sad, Serbia, September 2023.



OUTGOING

Final outreach event of H2020 INCOMING project

September 19th and 20th 2023.

Tuesday 19th September (Novi Sad, University of Novi Sad, Science and Technology Park)

09:30 – 09:45 Opening and Welcome Message

09:45 – 10:30 ICONIC centre: Growth and Benefits under INCOMING project – Prof. Dejan Vukobratovic

10:30 – 11:00 Coffee Break

What Next Session?

11:00 – 11:20 Prof. Cedomir Stefanovic (Aalborg University)

11:20 – 11:40 Prof. Alexandre Graell i Amat (Chalmers University of Technology)

11:40 – 12:00 Dr Gianluigi Liva (German Aerospace Centre)

12:00 – 12:20 Prof. Dejan Vukobratovic, Prof. Rastislav Struharik (ICONIC, University of Novi Sad)

Future of ICONIC - Poster Session

Poster session (ICONIC members research overview)

Tijana Devaja (UNS): Design and Analysis of Massive IoT Networks in Finite Block Length Regime

Vukan Ninkovic (UNS): On Autoencoder-Based Error Correcting Codes

Srdjan Sobot (UNS): UAV Based IoT Networks: Design, Analysis and Experimentation Study

Milica Petkovic (UNS): Hybrid OWC-RF Massive IoT Networks

Gorana Mijatovic (UNS): An information-theoretic framework to analyze interactions in point processes

Mirsad Cosovic (UNS): Distributed Inference over Linear Models using Alternate Gaussian Belief Propagation

Andrej Skala (UNS): IEEE 802.11az indoor localisation: detailed experimental study (collab w U-BLOX)

Milica Ostojic (UNS): Cellular V2X: testbed and experimentation study (collab w Continental)

12:20 – 14:00 Aleksandar Minja (UNS): Decoding Generalised LDPC Codes

Ognjen Kundačina (IVI): Graph Neural Networks for Power System State Estimation

Dragiša Mišković (IVI): Real-Time Fermentation Monitoring using e-Nose: AI-driven Cloud and IoT Approach

Milovan Medojević (IVI): REWARDING – Remote Water Monitoring and Intelligence

Jovana Kljajić (UNS): Deep learning methods for lesion detection on mammography images: INCISIVE experience

Ivan Lazić (UNS): INCISIVE: Improving cancer diagnosis and prediction with AI and Big Data

Nikola Simic (UNS): MARVEL: Multimodal extreme-scale data analytics for Smart City environments

Dusan Bortnik (UNS): NB-IoT platform for remote digit recognition in legacy metering

Nataša Samardžić (UNS): From Memristor Modelling towards Neuromorphic Circuits and Systems

Vuk Vranjković (UNS): Design of Machine Learning Hardware Accelerators

12:30 – 14:00 Lunch Break

Wednesday 20th September (Belgrade, Hotel Crowne Plaza Belgrade)

09:00 – 09:30 Arrival of participants

09:30 – 09:40 Welcome message from the Organisers

09:40 – 10:20 Keynote 1: Prof. Petar Popovski (Aalborg University, Denmark)

Timing and Reliability towards 6G wireless systems

09:40 – 10:20 Keynote 2: Ivan Seskar (WINLAB, Rutgers University, USA)

10:20 – 11:00 Exploring the Horizons of Wireless Innovation: From Physical Layer Experiments to Smart City Applications on the COSMOS Testbed

11:00 – 11:20 Coffee Break

11:20 – 12:00 Keynote 3: Prof. Haris Gacanin (RWTH Aachen University, Germany)

Metaverse-ready wireless communications and computing systems

12:00 – 12:40 Keynote 4: Prof. David Gomez Barquero (Polytechnic University of Valencia, Spain)

Opportunities, Challenges and Lessons Learned of Deploying Advanced 5G Experimentation Platforms

12:40 – 14:00 Lunch Break

14:00 – 14:40 Keynote 5: Konstantinos Chalkiotis (VP 6G & NTN, Deutsche Telekom, Germany)

On the way to 6G – Deutsche Telekom's view

14:40 – 15:20 Keynote 6: Prof. Robert Stewart (Strathclyde University, UK)

It's all about the Spectrum – How the Broadcast Use Case can help drive 5G SA Private Network Growth

15:20 – 16:00 Panel (Selected questions collected from the audience during 6 keynotes through online app)

Table 3. Final event of ICONIC project agenda.



Figure 6. Keynote Talks on the Path towards 6G, Final event, the 2nd day, Belgrade, Serbia, September 2023.



Figure 7. Final event, the 2nd day, Belgrade, Serbia, September 2023.

3 Special Sessions

Focused project special sessions are the main form of research-oriented networking and dissemination. Three workshops and/or special sessions were planned during the project duration, once per each project year. The first special session was organized during new and high-quality international conference - BalkanCom 2020. The conference is initially planned to be held in Novi Sad (Serbia) in June 2020, however, it was cancelled and postponed for late 2021 due to COVID pandemic. During Year 3 of the INCOMING project, two special sessions within international conferences with regional presence in Western Balkan region were organized: BalkanCom 2022 held in Sarajevo (Bosnia and Herzegovina), and European Signal Processing Conference (EUSIPCO) 2022 held in Belgrade (Serbia).

The second INCOMING project special session was organized at the BalkanCom 2022 conference held in Sarajevo (Bosnia and Herzegovina) on 22nd – 24th August, 2022. The session entitled *Massive Internet of Things and Edge Computing* was organised by Prof. Cedomir Stefanovic (AAU) and Prof. Dejan Vukobratovic (ICONIC, UNS). The core topic of the session was aligned with the INCOMING project activities in WP2 and WP3. The BalkanCom conference attracts world-leading researchers in the field of communications and signal processing, and features leading experts as keynotes and special session organisers, being suitable for promotion and outreach of ICONIC centre and INCOMING project as it takes place in the Balkans region, where the project targets to deliver its main impact. For more information about the special session, please check the following webpage: <https://www.balkancom.info/2022/cfp-special-01.html>, with the list of accepted and presented papers available at: <https://www.balkancom.info/2022/program.html#S1569607076>, also presented in the Table 4.

Wednesday, August 24 14:00 - 15:20

S9: Massive Internet of Things and Edge Computing

Room: Main Conference Room

Chairs: Čedomir Stefanović, Dejan Vukobratović

Service Assurance in 5G-based vCDN

Miguel Lopes, Daniel Corujo, Marco Araujo and Paulo Duarte

Decentralized Identity for IoT Systems (extended abstract and will not be published)

Muhammad Waleed, Sokol Kosta and Knud Erik Skouby

Machine Learning Methods for Device Identification Using Wireless Fingerprinting

Srdjan Sobot, Vukan Ninkovic, Dejan Vukobratović, Milan Pavlovic and Milos Radovanovic

Latency Characterization in Teleoperation Scenarios at Mobile Edge (extended abstract and will not be published)

Suraj Suman, Federico Chiariotti, Čedomir Stefanović, Strahinja Dosen and Petar Popovski

Table 4. The INCOMING project special session agenda, BalkanCom 2022.



Figure 8. The INCOMING project special session, BalkanCom 2022.

Technical Program

SS_14: Signal Processing and Machine Learning at the Edge for beyond 5G Radio Access Networks

Session Type: Lecture

Time: Tuesday, August 30, 14:10 - 15:50

Location: Adriatic

Session Chair: Dejan Vukobratovic, University of Novi Sad

SS_14.1: DYNAMIC RESOURCE ALLOCATION FOR MULTI-USER GOAL-ORIENTED COMMUNICATIONS AT THE WIRELESS EDGE

Francesco Binucci, Paola Banelli, University of Perugia, Italy; Paolo Di Lorenzo, Sergio Barbarossa, Sapienza University of Rome, Italy

SS_14.2: UAV-AIDED DECENTRALIZED LEARNING OVER MESH NETWORKS

Matteo Zecchin, David Gesbert, Marios Kountouris, EURECOM, France

SS_14.3: EDGE MACHINE LEARNING IN 3GPP NB-IOT: ARCHITECTURE, APPLICATIONS AND DEMONSTRATION

Dejan Vukobratovic, Milan Lukic, Ivan Mezei, Dragana Bajovic, Milos Savic, Zarko Bodroski, Srđjan Skrbic, Dusan Jakovetic, University of Novi Sad, Serbia; Dragan Danilovic, A1 Serbia, Serbia

SS_14.4: STRAGGLER-RESILIENT SECURE AGGREGATION FOR FEDERATED LEARNING

Reent Schlegel, Siddhartha Kumar, Eirik Rosnes, Simula UiB, Norway; Alexandre Graell i Amat, Chalmers University of Technology, Sweden

SS_14.5: REPULSIVE CLUSTERING BASED PILOT ASSIGNMENT FOR CELL-FREE MASSIVE MIMO SYSTEMS

Salman Mohebi, Andrea Zanella, Michele Zorzi, University of Padova, Italy

SS_14.6: USER CLUSTERING FOR RATE SPLITTING USING MACHINE LEARNING

Roberto Pereira, Xavier Mestre, Centre Tecnològic de Telecomunicacions de Catalunya, Spain; Anay Deshpande, Andrea Zanella, University of Padova, Italy; Cristian Vaca-Rubio, Elisabeth de Carvalho, Petar Popovski, Aalborg University, Denmark; David Gregoratt, Software Radio Systems, Spain

Table 5. The INCOMING project special session agenda, EUSIPCO 2022.

The INCOMING project special session was organized jointly with the related H2020 Marie Curie Innovative Training Network (ITN) project WINDMILL (<https://windmill-itn.eu/>) that focuses on

machine learning for wireless communications. This special session, entitled Signal Processing and Machine Learning at the Edge for Beyond 5G Radio Access Networks, was organized at EUSIPCO 2022, held in Belgrade (Serbia), 29th August – 02nd September 2022. The organisers were Prof. Dejan Vukobratovic (ICONIC, UNS, Serbia) and Dr Xavier Mestre (CTTC, Spain). The session featured six selected papers contributed by the authors from both INCOMING and WINDMILL projects. For more details about special sessions at EUSIPCO 2022 conference, please see https://2022.eusipco.org/?page_id=545, while the list of accepted and presented papers are presented in the Table 5, and can be found at: <https://www2.securecms.com/EUSIPCO2022/Papers/ViewSession.asp?Sessionid=1019>.

4 Dissemination and Outreach to Wider Community

Dissemination and outreach to wider community are important part of the project done via research-oriented and innovation-oriented channels.

The research dissemination consists of dissemination of project research and development results via:

- organization of project workshops and special sessions (see D3.6 and Section 3),
- dissemination of project results at high-impact journals and conferences (see Section 5),
- dissemination of research results via ICONIC (<https://iconic.ftn.uns.ac.rs/>) and INCOMING project web pages (<https://incoming.ftn.uns.ac.rs/>),
- dissemination of project and ICONIC centre achievements mainly through LinkedIn (<https://www.linkedin.com/company/28752451>) pages of both ICONIC and H2020 INCOMING.
- dissemination of research and development results to wider audiences for the sake of popularization of science (Researcher's Nights, FTN Open Doors events, elementary/high school visits, media press releases, etc.).

The innovation dissemination will be mainly done through 5G-IT-Hub, the projects window towards local/regional ICT environment. The 5G-IT-Hub is coordinated by ICONIC staff through WP4 activities and under leadership of Innovation Manager and 5G-IT-Hub administrator. More details on 5G-IT-Hub dissemination and outreach activities can be found in companion Deliverables D4.1, D4.2 and D4.3.

Among the highlights of dissemination and outreach activities during 2022 and extension period, we provide a following non-exhaustive list of actions:

- July 2022: Tijana Devaja, PhD student from ICONIC centre, attended and presented research work at *2022 13th International Symposium on Communication Systems, Networks and Digital Signal Processing (CSNDSP)*, Porto, Portugal, July 20-22 2022. The presented work is joint collaboration between **ICONIC** and **DLR** teams.
- September 2022: A team of PhD students from ICONIC centre (Tijana Devaja, Vukan Ninkovic, Ognjen Kundacina) attended and presented their research at **IEEE – SPS/EURASIP Summer School 2022 on “Data and Graph Driven Learning for Communications and Signal Processing”**, Banja Luka, Sept. 5-9, 2022. The event brought more than 60 students and 10 lecturers from all over the Europe and USA. Prof. Dejan Vukobratovic presented a lecture on “Gaussian Belief Propagation: Theory and Applications”.
- October 2022: Prof. Dejan Vukobratovic participated as a TPC Co-Chair at *IEEE Smart Grid Communication 2022* conference in Singapore (<https://sgc2022.ieee-smartgridcomm.org/committees/committee>). IEEE SGC is important event for H2020 INCOMING as Smart Grids are one of the main project's application scenarios encompassing both massive IoT and large-scale information processing domains.
- October 2022: Ognjen Kundacina, PhD student from ICONIC centre, attended and presented two research works at *2022 IEEE International Conference on Communications*,

Control, and Computing Technologies for Smart Grids (SmartGridComm), Singapore, October 25-28 2022.

- November 2022: Joint workshop of **ICONIC-CENTRE** and members of **INRIA Maracas Team Lyon** is jointly organised by H2020-INCOMING and Serbian-French “Pavle Savic” Bilateral Project MITRA (Massive IoT Random Access). The workshop focus was on massive IoT, from fundamentals to technologies, but also on hardware-accelerated machine learning and memristive-based spiking neural networks.
- February 2023: Milica Petkovic, SR from ICONIC centre, gave a short lecture on the topic of joint work between **ICONIC** and **AAU** teams at COST Action CA19111 NEWFOCUS Meeting, February 20-21 2023.
- March 2023: Tijana Devaja, PhD student from ICONIC centre, attended and presented research work at *2023 IEEE Wireless Communications and Networking Conference (WCNC)*, Glasgow, United Kingdom, March 26-29 2023. The presented work is joint collaboration between **ICONIC** and **DLR** teams.
- March 2023: Srdjan Sobot, PhD student from ICONIC centre, attended and presented research work at *2023 6th Conference on Cloud and Internet of Things (CIoT)*, Lisbon, Portugal, March 20-22, 2023.
- March 2023 Mladen Kovacevic, SR from ICONIC centre, became **Associate Editor** at *IEEE Transactions on Information Theory*.
- April 2023: A team from ICONIC centre (Srdjan Sobot, Tijana Devaja, Milica Petkovic, Dejan Vukobratovic) attended *the 1st French-Serbian Innovation Forum*, held in Belgrade, Serbia, April 13 2023. Prof. Dejan Vukobratovic participated in open panel about Serbia’s education, science and technological development.
- May 2023: Prof. Ian F. Akyildiz visit ICONIC centre, May 13 2023. During the visit, Prof. Akyildiz interacted with ICONIC research staff and gave a vision lecture on future of wireless communications.
- May 2023: Milica Petkovic, SR from ICONIC centre, attended and presented research work at *the 32nd Wireless and Optical Communications Conference (WOCC 2023)*, Newark, NJ, USA, May 5-6 2023. The presented work is joint collaboration between ICONIC and AAU teams.
- May 2023: Vukan Ninkovic, PhD student from ICONIC centre, attended and presented research work at *2023 IEEE International Conference on Communications (ICC)*, Rome, Italy, May 28- June 01 2023. The presented work is joint collaboration between **ICONIC** and **CHALMERS** teams.
- May 2023: Prof. Dejan Vukobratovic gave a lecture at *Serbian Academy of Sciences and Arts (SANU)* – Novi Sad, May 10 2023.
- September 2023: Workshop as part of Serbia-China bilateral project "AI-enabled IoT Data Transmission Technologies" between ICONIC centre and Tongji University.
- September 2023: Vukan Ninkovic, PhD student from ICONIC centre, attended and presented research work at *2023 IEEE 24th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, Shanghai, China, September 25-28 2023.

5 Dissemination at High Impact Conferences and Journals

The primary research impact of INCOMING project is accomplished through research contributions published in top-tier journals and conferences. Balancing the research production across different groups of ICONIC centre and cross-fertilization of results is achieved by INCOMING project, leading to connection of the three ICONIC groups into a coherent team.

Based on the adopted definition of publications in high-impact journals presented in deliverable D1.5, a cumulative list of publications published by ICONIC centre members during the project duration (2020 - 2023) is provided below. For completeness, definition of a high-impact publication in the dissemination is repeated.

Definition (The high-impact publication): The scientific publication is considered high-impact in the research domain of INCOMING project if it is published by **the journal published by the Institute of Electronic and Electrical Engineers (IEEE)**, or if the impact factor of the journal is **within top 30% of the journals sorted by their impact factor values in a SCI (Science Citation Index) list** of journals with impact factor for a research field of the journal and for the publication year of the journal.

In the following, we provide a list of journal publications of ICONIC staff members published during 2020, 2021, 2022 and 2023 in journals with impact factor (SCI) with particular emphasis on journals which fall under category of high-impact publications as defined above. We also emphasize if the work is motivated by H2020 INCOMING project activities, in which case the publication has explicit acknowledgement to H2020 INCOMING project.

Publications in scientific journals

2023

1. M. Cosovic, D. Miskovic, M. Delalic, D. Raca, D. Vukobratovic, "Distributed Inference over Linear Models using Alternating Gaussian Belief Propagation," **IEEE Internet of Things Journal**, June 2023. [Flagship IEEE journal within top 10% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
2. M. Petković, G. T. Đorđević, J. Makal, Z. Marjanović, G. V. Milovanović, "Error Probability of a Coherent M-ary PSK FSO System Influenced by Phase Noise," **Mathematics**, Vol. 11, No. 121, January 2023. [Flagship journal within top 10% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
3. D. Jakovetić, D. Bajović, A. K. Sahu, S. Kar, N. Milošević, D. Stamenković, "Nonlinear gradient mappings and stochastic optimization: A general framework with applications to heavy-tail noise," **SIAM Journal on Optimization**, Vol. 33, No. 2, June 2023. [Flagship journal within top 10% of SCI journals in the field]
4. N. Petrović, D. Bajović, S. Kar, D. Jakovetić, A. K. Sahu, "Large Deviations for Products of Non-Identically Distributed Network Matrices With Applications to Communication-Efficient Distributed Learning and Inference," **IEEE Transactions on Signal Processing**, Vol. 71, pp. 1319-1333, April 2023. [within top 30% of SCI journals in the field]
5. O. Kundacina, M. Cosovic, D. Miskovic, D. Vukobratovic, "Graph neural networks on factor graphs for robust, fast, and scalable linear state estimation with PMUs," **Sustainable Energy, Grids and Networks**, Vol. 34, June 2023. [within top 30% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]

6. V. Kalušev, B. Popović, M. Janev, B. Brkljač, N. Ralević, "Measure of similarity between GMMs based on autoencoder-generated Gaussian component representations," **Axioms**, Vol. 2, No. 6, pp. 1-21, May 2023. [within top 30% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
7. D. Jakovetić, M. Vukovic, D. Bajović, A. K. Sahu, S. Kar, D. Stamenković, "Distributed Recursive Estimation under Heavy-Tail Communication Noise," **SIAM Journal on Control and Optimization**, Vol. 61, No. 3, June 2023. [within top 30% of SCI journals in the field]
8. M. Petkovic, D. Vukobratovic, A. Munari, F. Clazzer, "Two-Tier Multi-Rate Slotted ALOHA for OWC/RF-Based IoT Networks," **IEEE Communications Letters**, Vol. 27, No. 4, pp. 1190-1194, April 2023. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
9. T. Devaja, M. Petković, F. J. Escribano, Č. Stefanović, D. Vukobratović, "Slotted Aloha With Capture for OWC-Based IoT: Finite Block-Length Performance Analysis," **IEEE Access**, Vol. 11, pp. 76804-76815, 2023. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
10. S. Khursheed, N. Badruddin, V. Jeoti, D. Vukobratovic, M.A. Hashmani, "Low Computational Coding-Efficient Distributed Video Coding: Adding a Decision Mode to Limit Channel Coding Load," **Entropy**, Vol. 25, No. 241, 2023. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]

2022

11. A. Minja and V. Šenk: "SISO Decoding of \mathbb{Z}_4 Linear Kerdock and Preparata Codes," **IEEE Transactions on Communications**, Vol. 70, No. 3, pp. 1497-1507, 2022. [Flagship IEEE journal within top 10% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
12. P. D. Bojović, T. Malbašić, D. Vujošević, G. Martić, Ž. Bojović, "Dynamic QoS Management for a Flexible 5G/6G Network Core: A Step toward a Higher Programmability," **Sensors**, Vol. 22, No.8, pp. 1-23, 2022. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
13. V. Vranjković, P. Teodorović, R. Struharik: "Universal Reconfigurable Hardware Accelerator for Sparse Machine Learning Predictive Models," **Electronics**, Vol. 11, No. 8, pp. 1-37, 2022. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
14. N. M. Samardžic, J. S. Bajic, D. L. Sekulic, S. Dautovic: "Volatile Memristor in Leaky Integrate-and-Fire Neurons: Circuit Simulation and Experimental Study," **Electronics**, Vol. 11, No. 6, pp. 894 (1-13), 2022. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
15. I. Mezei, M. Lukić, L. Berbakov, B. Pavković, B. Radovanović: "Grapevine downy mildew warning system based on NB-IoT and energy harvesting technology," **Electronics**, Vol. 11, No 3, pp. 356 (1-19), 2022. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
16. M. Kovačević: "Lattice Packings of Cross-polytopes from Reed-Solomon Codes and Sidon Sets," **Bulletin of the London Mathematical Society**, 2022. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
17. M. Petkovic, D. Bajovic, D. Vukobratovic, J. Machaj, P. Brida, G. McCutcheon, L. Stankovic, V. Stankovic, "Smart Dimmable LED Lighting Systems," **Sensors**, Vol. 22, pp. 1-21, 2022. [within top 50% of SCI journals in the field]
18. M. Kovačević, D. Vukobratović: "Asymptotic Behavior and Typicality Properties of Runlength-Limited Sequences," **IEEE Transactions on Information Theory**, Vol. 68, No. 3, pp. 1638-1650, 2022. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
19. T. Malbašić, P. D. Bojović, Ž. Bojović, J. Šuh, D. Vujošević: "Hybrid SDN Networks: A multi-parameter server load balancing scheme," **Journal of Network and Systems Management**, Vol. 30, No.2, pp. 1-28, 2022. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
20. J. Bjelica, N. Djuric, S. Djuric, "Performance analysis and application of a hybrid electromagnetic-triboelectric nanogenerator for energy harvesting," **Energy Reports**, Vol. 8, pp. 9184-9200, 2022. within top 50% of SCI journals in the field]
21. L. Krstanović, B. Popović, M. Janev, B. Brkljač: "Bootstrapped SSL CycleGAN for Asymmetric Domain Transfer," **Applied Sciences**; Vol. 12, No. 7: 3411, pp. 1-17, 2022. [within top 50% of SCI journals in the field]

22. D. Mišković, L. Milić, A. Čilag, T. Berisavljević, A. Gottscheber, M. Raković: “Implementation of Robots Integration in Scaled Laboratory Environment for Factory Automation,” **Applied Sciences**, Vol. 12, No. 3, 2022. [within top 50% of SCI journals in the field]
23. G. Bravos, A. J. Cabrera, C. Correa, D. Danilović, N. Evangeliou, G. Ezov, Z. Gajica, D. Jakovetic, L. Kallipolitis, M. Lukic, J. Mascolo, D. Maserà, R. Mazo, I. Mezei, A. Miaoudakis, N. Milosevic, W. Oliff, J. Robin, M. Smyrlis, G. Sakellari, G. Stamatias, D. Stamenković, S. Skrbic, C. Souveyet, S. Vantolas, G. Vasiliadis, D. Vukobratovic, “Cybersecurity for Industrial Internet of Things: Architecture, Models and Lessons Learned,” **IEEE Access**, Vol. 10, pp. 124747-124765, 2022. [within top 50% of SCI journals in the field]
24. M. Kovačević: “On the Maximum Number of Non-Confusable Strings Evolving under Short Tandem Duplications,” **Problems of Information Transmission**, Vol. 58, No. 2, pp. 111-121, 2022. [SCI journal; explicit acknowledgement to H2020 INCOMING project]
25. M. Kovačević: “Abelian Difference Sets as Lattice Coverings and Lattice Tilings,” **Bulletin of the Australian Mathematical Society**, pp. 1-8, 2022. [SCI journal; explicit acknowledgement to H2020 INCOMING project]
26. G. Mijatovic, R. Pernice, A. Perinelli, Y. Antonacci, A. Busacca, M. Javorka, L. Ricci and L. Faes: “Measuring the Rate of Information Exchange in Point-Process Data With Application to Cardiovascular Variability,” **Frontiers in Network Physiology/ sect. Information Theory**, Vol. 1, pp. 1-19, 2022, [new journal; explicit acknowledgement to H2020 INCOMING project]

2021

27. M. Cosovic, M. Delalic, D. Raca, D. Vukobratovic: “Observability Analysis for Large-Scale Power Systems Using Factor Graphs,” **IEEE Transactions on Power Systems**, DOI: [10.1109/TPWRS.2021.3057136](https://doi.org/10.1109/TPWRS.2021.3057136), Vol. 36, No. 5, 2021. [Flagship IEEE journal within top 10% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
28. G. Mijatovic, Y. Antonacci, T. Loncar-Turukalo, L. Minati, L. Faes: “An Information-Theoretic Framework to Measure the Dynamic Interaction between Neural Spike Trains,” **IEEE Transactions on Biomedical Engineering**, Vol. 86, No. 12, pp. 3471-3481, 2021. [within top 30% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
29. L. Zambrano, K. Karaduzovic-Hadziabdic, T. Loncar-Turukalo, P. Przymus, et al.: “Applications of machine learning in human microbiome studies: a review on feature selection, biomarker identification, disease prediction and treatment”, **Frontiers in Microbiology**, Vol. 12, pp.1-25, 2021. [within top 30% of SCI journals in the field]
30. V. Ninkovic, D. Vukobratovic, C. Häger, H. Wymeersch, A. Graell i Amat: “Autoencoder-Based Unequal Error Protection Codes,” **IEEE Communications Letters**, Vol. 25, No. 11, pp. 3575-3579, 2021. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
31. V. Ninkovic, A. Valka, D. Dumic, D. Vukobratovic: “Deep Learning-Based Packet Detection and Carrier Frequency Offset Estimation in IEEE 802.11ah,” **IEEE Access**, Vol. 9, pp. 99853-99865, 2021. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
32. J. Stanulovic, N. Mitton, I. Mezei: “Routing with Face Traversal and Auctions Algorithms for Task Allocation in WSRN,” **Sensors**, Vol. 21, No. 18, pp. 1-23, 2021. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
33. G. Mijatovic, T. Loncar-Turukalo, N. Bozanic, N. Milosavljevic, R. Storchi, L. Faes: “A Measure of Concurrent Neural Firing Activity Based on Mutual Information,” **Neuroinformatics**, Vol. 19, pp. 1-17, 2021. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
34. N. A. Androustos, H. E. Nistazakis, M. Petkovic, G. T. Djordjevic, A. N. Stassinakis, C. K. Volos: “Multi-hop DF relayed FSO links with various modulation formats emulated by a dual-hop scheme for strong turbulence conditions,” **Optik**, Vol. 227, Feb. 2021. [within top 50% of SCI journals in the field]
35. M. Savic, M. Lukic, D. Danilovic, Z. Bodroski, D. Bajović, I. Mezei, D. Vukobratovic, S. Skrbic, D. Jakovetic, “Deep Learning Anomaly Detection for Cellular IoT With Applications in Smart Logistics,” **IEEE Access**, Vol. 9, pp. 59406-59419, 2021. [within top 50% of SCI journals in the field]

36. M. Zanin, I. Ivanoska, B. Güntekin, G. Yener, T. Loncar-Turukalo, N. Jakovljevic, O. Sveljo, D. Papo, "A fast transform for brain connectivity difference evaluation," **Neuroinformatics**, 2021. [within top 50% of SCI journals in the field]
37. V. Tadic, T. Loncar-Turukalo, A. Odry, Z. Trpovski, A. Toth, Z. Vizvari, P. Odry: "A Note on Advantages of the Fuzzy Gabor Filter in Object and Text Detection," **Symmetry**, Vol. 13, No. 4, 2021. [within top 50% of SCI journals in the field]
38. D. Rakanović, V. Vranjković, R. Struharik, "Argus CNN Accelerator Based on Kernel Clustering and Resource-Aware Pruning," **Elektronika ir Elektrotechnika**, Vol. 27, No. 3, pp. 57-70, 2021. [SCI journal; explicit acknowledgement to H2020 INCOMING project]
39. M. Kovačević, "On the Maximum Entropy of a Sum of Independent Discrete Random Variables," **Theory of Probability and Its Applications**, Vol. 66, No. 3, pp. 482-487, 2021. [SCI journal; explicit acknowledgement to H2020 INCOMING project]
40. I. Lazic, R. Pernice, T. Loncar-Turukalo, G. Mijatovic, L. Faes, "Assessment of Cardiorespiratory Interactions during Apneic Events in Sleep via Fuzzy Kernel Measures of Information Dynamics," **Entropy (Basel)**, Vol. 23, No. 6, 698, May 2021. [explicit acknowledgement to H2020 INCOMING]

2020

41. D. Jakovetic, D. Bajovic, J. Xavier, J. M. F. Moura: "Primal-dual methods for large-scale and distributed convex optimization and data analytics," **Proceedings of the IEEE**, Vol. 108, No. 11, pp. 1923-1938, 2020. [Flagship IEEE journal within top 10% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
42. M. Petkovic, A. Cvetkovic, M. Narandzic, N. Chatzidiamantis, D. Vukobratovic, G. K. Karagiannidis: "Mixed RF-VLC Relaying Systems for Interference-Sensitive Mobile Applications," **IEEE Transactions on Vehicular Technology**, Vol. 69, No. 10, pp. 11099-11111, 2020. [IEEE journal within top 30% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
43. M. Radosavljevic, B. Brkljac, P. Lugonja, V. Crnojevic, Z. Trpovski, Z. Xiong, D. Vukobratovic: "Lossy Compression of Multi-Spectral Satellite Images with Applications to Crop Thematic Mapping: A HEVC Comparative Study," **Remote Sensing**, Vol. 12, No. 10, pp. 1-33, 2020. [within top 30% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
44. N. Krklec Jerinkic, D. Jakovetic, N. Krejic, D. Bajovic: "Distributed Second-Order Methods With Increasing Number of Working Nodes," **IEEE Transactions on Automatic Control**, Vol. 65, No. 2, pp. 846-853, 2020. [within top 30% of SCI journals in the field]
45. M. Panic, D. Jakovetic, D. Vukobratovic, V. Crnojevic, A. Pizurica: "MRI Reconstruction using Markov Random Field and Total Variation as Composite Prior," **Sensors**, Vol. 20, No. 11, pp. 1-15, 2020. [within top 30% of SCI journals in the field]
46. P. Tonkovic Petar, S. Kalajdziski, E. Zdravevski, P. Lameski, R. Corizzo, I. M. Pires, N. Garcia Nuno, T. Lončar-Turukalo, V. Trajkovic: "Literature on Applied Machine Learning in Metagenomic Classification: A Scoping Review," **Biology**, Vol. 9, No. 12, Dec. 2020 [within top 30% of SCI journals in the field]
47. Y. Sakai, V. Y. F. Tan, M. Kovačević: "Second- and Third-Order Asymptotics of the Continuous-Time Poisson Channel," **IEEE Transactions on Information Theory**, Vol. 66, No. 8, pp. 4742-4760, 2020. [IEEE journal within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
48. M. Radosavljevic, Z. Xiong, L. Lu, D. Hohl, D. Vukobratovic: "High Bit-Depth Seismic Data Compression: A Novel Codec Under the Framework of HEVC," **IEEE Access**, Vol. 8, pp. 114443-114459, 2020. [IEEE journal within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
49. D. Vukobratovic, F. Escribano: "Adaptive Multi-Receiver Coded Slotted ALOHA for Indoor Optical Wireless Communications," **IEEE Communications Letters**, Vol. 24, No. 6, pp. 1308-1312, 2020. [within top 50% of SCI journals in the field]
50. P. Xiao, S. Cheng, V. Stankovic, D. Vukobratovic: "Averaging is Probably not the Optimum Way of Aggregating Parameters in Federated Learning," **Entropy**, Vol. 22, No. 3, pp. 1-11, 2020. [within top 50% of SCI journals in the field]

51. M. Kovačević: “Signaling to Relativistic Observers: An Einstein–Shannon–Riemann Encounter,” **Problems of Information Transmission**, Vol. 56, No. 4, pp. 303-308, 2020. [SCI journal; explicit acknowledgement to H2020 INCOMING project]
52. V. Vranjkovic, R. Struharik: “Hardware Acceleration of Sparse Support Vector Machines for Edge Computing,” **Elektronika ir Elektrotehnika**, Vol. 26, No. 3, pp. 42-53, 2020. [SCI journal; explicit acknowledgement to H2020 INCOMING project]
53. I. Mezei: “Evolution of an educational microprocessor,” **Computer Applications in Engineering Education**, Vol. 25, No. 5, pp. 1265-1277, 2020. [SCI journal; explicit acknowledgement to H2020 INCOMING project]
54. Z. Bojovic, P. Bojovic, D. Vujošević, J. Suh: “Education in times of crisis: Rapid transition to distance learning,” **Computer Applications in Engineering Education**, Vol. 28, No. 6, pp. 1-23, 2020. [SCI journal]
55. V. Tadić, Z. Kiraly, P. Odry, Z. Trpovski, T. Loncar Turukalo: “License Plate Detection with Gabor Filter Bank and Fuzzified Gabor Filter: a comparative study,” **Acta Polytechnica Hungarica**, Vol. 17, No. 1, pp. 61-81, 2020. [SCI journal]
56. M. Pot, Z. Trpovski, T. Loncar Turukalo: “Analysis and Improvement of JPEG Compression Performance using Custom Quantization and Block Boundary Classifications,” **Acta Polytechnica Hungarica**, Vol. 17, No. 6, pp. 171-191, 2020. [SCI journal]
57. S. Dautovic, N. Samardzic, A. Juhas, “Takacs Model of Hysteresis in Mathematical Modeling of Memristors,” **Radioengineering**, Vol. 29, No. 1, pp.147-158, 2020. [SCI journal]

Note that 35 from the listed 57 high impact publications of ICONIC centre staff are inspired by the project activities within H2020 INCOMING project and they have explicit acknowledgment for INCOMING Project No. 856967. If we compare the number of high impact publications with explicit acknowledgment for INCOMING project by years, it can be concluded that there is a significant increase in the number of publications. In 2020 only 47 % of publications was inspired by the project activities within H2020 INCOMING project (8 out of 17 papers), in 2021 57 % (8 out of 14 papers), in 2022 68.75 % (11 out of 16 papers), and in period Jan.-Sept. 2023 80 % (8 out of 10 papers) (see Table 6.).

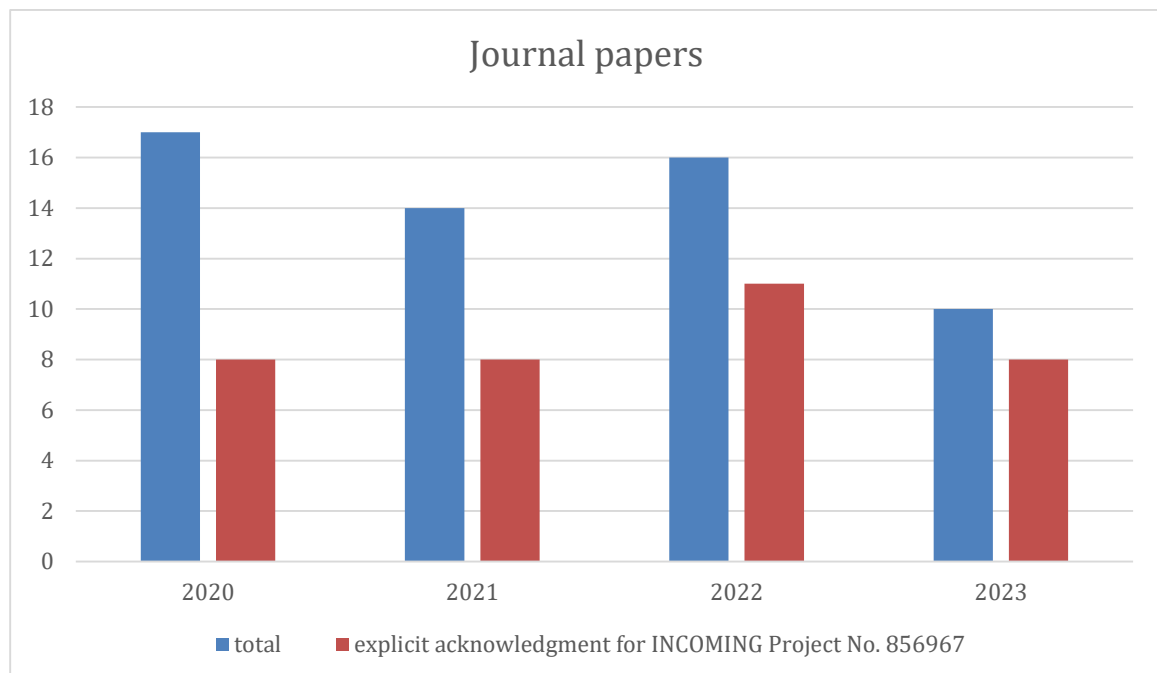


Table 6. Journal papers with explicit acknowledgment for INCOMING project – chart statistics.

Besides the listed 6 high impact publications, ICONIC members have published the total of 11 and 27 papers in journals with impact factor whose position on the SCI list lies between the top 30% and top 50% of SCI journals, respectively, in 2023, 2022, 2021 and 2020 (see Table 7.)

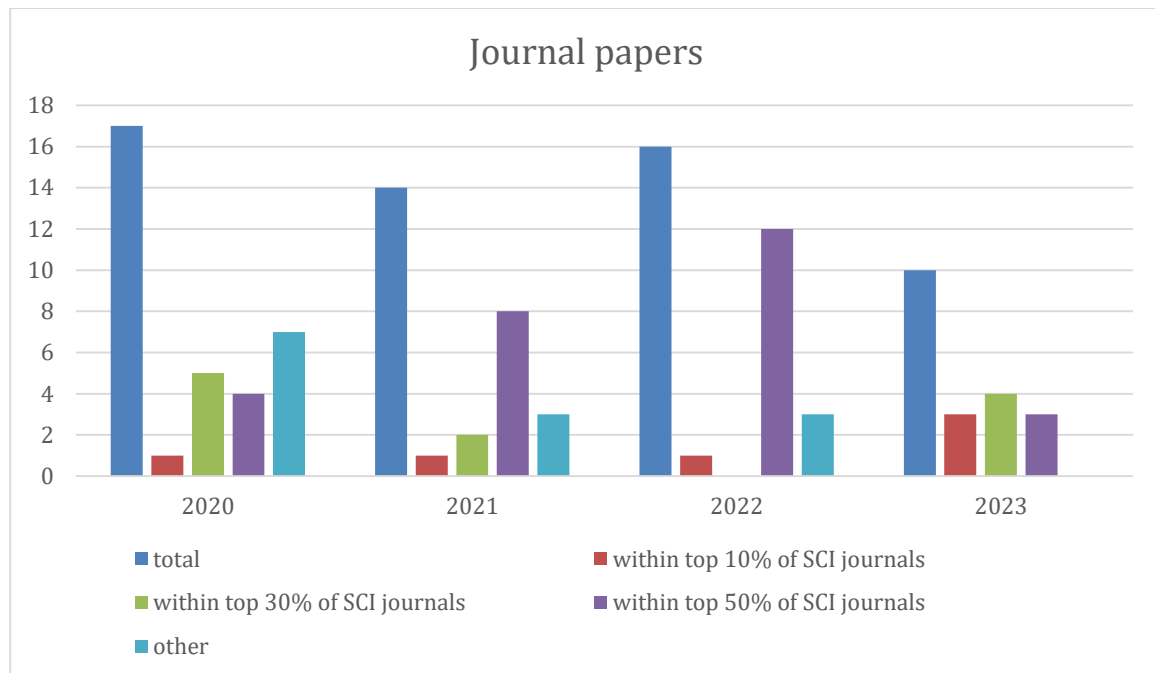


Table 7. Journal papers – chart statistics.

Publications at scientific conferences

Additionally, the list of publications presented at international conferences during 2023, 2022, 2021 and 2020 by ICONIC staff members is listed below.

2023

1. S. Sobot, M. Lukic, D. Bortnik, V. Nikic, B. Lima, M. Beko, D. Vukobratovic, "Two-Tier UAV-based Low Power Wide Area Networks: A Testbed and Experimentation Study," **2023 6th Conference on Cloud and Internet of Things (CIoT)**, Lisbon, Portugal, March 2023. [international conference]
2. G. Mijatovic, C. Bara, R. Pernice, T. Loncar-Turukalo, G. Nollo, L. Faes, "Exploring the Short-Term Memory of Heart Rate Variability through Model-Free Information Measures," **45th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)**, Sydney, Australia, July 2023 [international conference]
3. O. Kundacina, G. Gojic, M. Cosovic, D Miskovic, Dejan Vukobratovic, "Scalability and Sample Efficiency Analysis of Graph Neural Networks for Power System State Estimation," **Sixth International Balkan Conference on Communications and Networking (BalkanCom)**, Istanbul, June 2023. [international conference]
4. O. Kundacina, G. Gojic, M. Mitrovic, D. Miskovic, D. Vukobratovic, "Supporting Future Electrical Utilities: Using Deep Learning Methods in EMS and DMS Algorithms," **22nd International Symposium INFOTEH-JAHORINA (INFOTEH)**, Jahorina, Bosnia and Herzegovina, March 2023 [international conference]
5. M. Mladen, J. Banović, J. Galić, G. Gardašević, M. Petković, "Speech quality assessment in visible light communications," **2023 22nd International Symposium INFOTEH-JAHORINA (INFOTEH)**, East Sarajevo, Bosnia and Herzegovina, March 2023. [international conference]
6. T. Devaja, M. Petkovic, A. Munari, F. Clazzer, M. Beko, D. Vukobratovic, "Massive Machine-Type Communications via Hybrid OWC/RF Networks in Finite Block-Length Regime," **2023 IEEE Wireless Communications and Networking Conference (WCNC)**, Glasgow, United Kingdom, March 2023. [international conference]

7. H. Farag, D. Vukobratovic, A. Munari, C. Stefanovic, "Timely and Efficient Information Delivery in Real-Time Industrial IoT Networks," **IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)**, Toronto, Canada, September 2023.
8. M. Petkovic, S. A. Tegos, P. D. Diamantoulakis, D. Vukobratovic, E. Panayirci, Č. Stefanović, G. K. Karagiannidis, "Slotted Aloha for Optical Wireless Communications in Internet of Underwater Things," **2023 32nd Wireless and Optical Communications Conference (WOCC)**, Newark, NJ, USA, May 2023
9. S. M. Ali, M. Beko, D. Vukobratović, Č. Stefanović, "On the Performance of the Free-Access Tree Algorithm with MPR, SIC, and Single-Slot Memory," **2023 International Balkan Conference on Communications and Networking (BalkanCom)**, Istanbul, June 2023. [international conference]
10. V. Ninkovic, D. Vukobratovic, C. Häger, H. Wymeersch, A. Graell i Amat, "Rateless Autoencoder Codes: Trading off Decoding Delay and Reliability," **IEEE International Conference on Communications (ICC)**, Rome, Italy, 2023. [international conference]
11. V. Ninkovic, D. Vukobratovic, A. Pastore, C. Anton-Haro, "A Weighted Autoencoder-Based Approach to Downlink NOMA Constellation Design," **2023 IEEE 24th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)**, Shanghai, China, September 2023. [international conference]
12. D. Bajovic, D. Jakovetic, S. Kar, "Large deviations rates for stochastic gradient descent with strongly convex functions," **International Conference on Artificial Intelligence and Statistics**, Valencia, Spain, April 2023. [international conference]
13. A. Bakhtiarnia, N. Milošević, Q. Zhang, D. Bajović, A. Iosifidis, "Dynamic Split Computing for Efficient Deep EDGE Intelligence," **ICASSP 2023 - 2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)**, Rhodes Island, Greece, June 2023. [international conference]
14. O. Kundačina, M. Petković, A. Munari, D. Vukobratović, L. Badia, "Move Away From Me! User Repulsion Under Proximity-Induced Interference in OWC Systems," accepted for presentation at **European Wireless 2023**, Rome, Italy, October 2023. [international conference]
15. P. D. Bojović, Ž. Bojović, "Design and development of an intelligent energy management system for a microgrid application", accepted for presentation at **Power Electronics Ee2023 conference**, Novi Sad, Serbia, 2023. [international conference]

2022

16. V. Vincan, J. Zoranovic, N. Samardzic, S. Dautovic, "All-memristive Spiking Neural Network Circuit Simulator," **11th IEEE International Conference on Modern Circuits and Systems Technologies (MOCASST)**, Bremen, Germany, June 2022. [International conference]
17. S. Petkovic, L. Milic, M. Nikolic, D. Miskovic, M. Rakovic, "Comparison of SLAM algorithms on omnidirectional four-wheel mobile robot," **9th International Conference on Electrical, Electronic and Computing Engineering (IcETRAN 2022)**, Novi Pazar, Serbia, June 2022. [International conference]
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Note that among **57** listed journal papers, **3** papers are a direct result of joint collaboration between INCOMING partners:

- IEEE Communications Letters, November 2021, **ICONIC** team from UNS and **Chalmers** team;
- IEEE Communications Letters, April 2023, **ICONIC** team from UNS and **DLR** team;
- IEEE Access, June 2023, **ICONIC** team from UNS and **AAU** team.

Also, among **50** listed conference papers, **9** papers are a direct result of joint collaboration of INCOMING project. The paper presented at **CSNDSP 2020** in July 2020 (online) is a result of joint collaboration of two partners: ICONIC team from UNS and DLR team, and represents a first joint conference papers published among the partner teams within INCOMING project. The paper presented at **ISWCS 2021** in September 2021 (online) is a result of joint collaboration of two partners: ICONIC team from UNS and AAU team. Due to COVID-19 pandemic regulations relaxation, mutual research staff visits among INCOMING project partners took place in 2022 and 2023, which resulted in following conference papers: **CSNDSP 2022** in July 2022, Porto, Portugal - ICONIC and DLR; **WCNC 2023** in March 2023, Glasgow, UK - ICONIC and DLR; **WOCC 2023** in May 2021, Newark, USA - ICONIC and AAU; **ICC 2023** in May 2023, Rome, Italy - ICONIC and Chalmers; **BalkanCom 2023** in June 2023, Istanbul, Turkey - ICONIC and AAU; **PIMRC 2023** in September 2023, Toronto – ICONIC, DLR, AAU; **European Wireless 2023** in October 2023, Rome, Italy – ICONIC and DLR.

Participation in R&D Activities and Projects

During 2022 and extension period, ICONIC researchers continued to secure funding for their future research and innovation activities. Below, we list most important projects that involve ICONIC staff members during 2022 and 2023, as well as joint EU funding applications submitted by INCOMING consortia members. For the full list of projects involving ICONIC staff members, please see: <https://iconic.ftn.uns.ac.rs/projects/>

- **H2020 RIA project INCISIVE** (A multimodal AI-based toolbox and an interoperable health imaging repository for the empowerment of imaging analysis related to the diagnosis, prediction and follow-up of cancer) includes information processing group of ICONIC with Dr Tatjana Loncar-Turukalo as Scientist in Charge. More information about the project is available at: <https://cordis.europa.eu/project/id/952179>.
- **H2020 RIA project MARVEL** (Multimodal extreme scale analytics for smart cities environments) involves information processing and communication groups of ICONIC with Dr Dragana Bajovic as Scientist in Charge. More information about the project is available at: <https://cordis.europa.eu/project/id/957337>.
- Two ICONIC researchers are active **Management Committee Members of COST actions**. In particular, Dr Milica Petkovic is a WP4 Co-Chair of COST action NEWFOCUS (European Network on Future Generation Optical Wireless Communication Technologies), Dr Branko Brkljac is an MC member of COST action SENSECO (Optical synergies for spatiotemporal SENSing of Scalable ECOpHysiological traits).
- During 2021, two short-term (1 year) collaboration projects funded by **Serbian Science Fund** (<http://fondzanauku.gov.rs/?lang=en>) will take place. The project AVIoTION will connect ICONIC researchers with Lusofona University in Lisbon (Portugal) in the domain of drone-based IoT localization and communication, while BigSleep project will connect ICONIC researchers with University of Strathclyde, Glasgow (UK) in the domain of graph signal processing methods in data-driven sleep phenomapping.

- **HORIZON-CL4-2023-HUMAN-01-CNECT project ELOQUENCE** (Multilingual and Cross-cultural interactions for context-aware, and biascontrolled dialogue systems for safety-critical applications) involves signal processing groups of ICONIC. Starts on 01 January 2023.
- **H2020 RIA project REMARKABLE** (Rural environmental monitoring via ultra wide-area networks and distributed federated learning) involves communication and environmental engineering groups of ICONIC. More information about the project is available at: <https://cordis.europa.eu/project/id/101086387>.
- **Green program of cooperation between science and economy of the Science Fund of the Republic of Serbia - REWARDING** (Remote water quality monitoring and intelligence) involves communication, information processing and environmental engineering groups of ICONIC with Dr Dejan Vukobratovic as Scientist in Charge.

H2020 INCOMING initiated several joint bids for EU funding between ICONIC researchers and EU partners. The list of such project submissions is provided below:

- ICONIC researchers (Prof. Dejan Vukobratovic) included a team of researchers of ICONIC in two proposals 6G-READY and 6G-SCALAR submitted in the first and in the second call of 6G Smart Networks and Services (SNS), Stream B project calls. The project submissions were not selected for funding.
- ICONIC researchers (Prof. Dejan Vukobratovic) teamed up with DLR and 8 other partners around EU to submit a proposal for Horizon Europe Doctoral Networks. The project entitled DRASTIC - DRone-ASSisted smarT city servICes did not receive funding but has been evaluated with high marks (88.90/100)
- ICONIC researchers (Dr Milica Petkovic) teamed up with AAU researchers and 7 other partners around EU to submit a proposal for Horizon Europe Doctoral Networks. The project entitled AMBITIOUS – Ambient Intelligence and Indoor Occupancy Systems. The proposal was not selected for funding (83.4/100).
- ICONIC researchers (Prof. Rastislav Struharik) from system design and hardware implementation group teamed up with CHALMERS, and jointly with TU Dresden submitted a Twinning for WBC proposal in Widening call. The project scored a very good result but unfortunately, it has not been selected for funding (13.0/15 points).

The above indicators clearly demonstrate that ICONIC researchers are active in collaboration with the EU partners both in the research domain but also in joint bids for EU project funding.