



Horizon 2020 Program  
WIDESPREAD-03-2018-TWINNING

Innovation and excellence in massive-scale communications and  
information processing

INCOMING (Project No. 856967)

**D6.2: Networking, dissemination and outreach activities including  
the event list: Year 2<sup>1</sup>**

**Abstract:** This document presents a report on the 2<sup>nd</sup> year networking, dissemination and outreach activities of INCOMING project.

Contractual Date of Delivery	30/06/2021
Actual Date of Delivery	30/06/2022
Deliverable Security Class	Public
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<sup>1</sup> The research leading to these results has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 856967.

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<b>Version</b>	<b>Date</b>	<b>By</b>	<b>Overview</b>
v3.0	30/06/2022	Editor	Final version.
v2.0	20/06/2022	External Reviewer	Second draft.
v1.0	06/06/2022	Editor and Internal Reviewers	First draft.

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## List of Abbreviations

<b>AAU</b>	Aalborg University
<b>CHALMERS</b>	Chalmers University of Technology
<b>COVID</b>	Corona Virus Disease
<b>DLR</b>	German Aerospace Centre
<b>ER</b>	Experienced Researcher
<b>ESR</b>	Early Stage Researcher
<b>EU</b>	European Union
<b>FTN</b>	Faculty of Technical Sciences, University of Novi Sad
<b>ICT</b>	Information and Communication Technologies
<b>IEEE</b>	Institute of Electrical and Electronic Engineers
<b>SCI</b>	Science Citation Index
<b>SEE</b>	South Eastern Europe
<b>UNS</b>	University of Novi Sad
<b>WP</b>	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 second project year of H2020 INCOMING. Among the most important events, we emphasize a successful organisation of the first project special session held in the hybrid mode and collocated with BalkanCom 2021 conference in Novi Sad during September 2021 (the special session has been postponed for over a year due to the decision to postpone BalkanCom). The special session marked a beginning of the project phase where in-person collaboration gradually became possible due to progressive removal of travel restrictions imposed during the COVID-19 pandemic. We note that, due to COVID-19 pandemic, original plans had to be revised and most of the dissemination and outreach activities during 2021 has been done as part of online events.

# 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. Work Package WP6 is dedicated to networking, dissemination and outreach, with the main goals of WP6 listed below:

- 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 is divided into two 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 main internal research-oriented networking and dissemination event is brain-storming week. The brain-storming week aims to gather as many senior researchers from project partners to a single location to a week-long event where they would collaborate and exchange ideas in small topical 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.
- **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 promote ICONIC centre and INCOMING project at relevant regional events.

In the following, we describe the activities done during the second project year. 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

The second brain-storming week was originally planned (according to the project grant agreement) for the beginning of the second year of the project, that is, for the period of early 2021 (February 2021). However, due to widespread COVID-19 travel restrictions, it was impossible to plan a physical organisation of such an event. On the other hand, the way how this type of event has been conceived, it was agreed that it is impossible to move the event to an online format.

We recall that the idea of brain-storming weeks is to bring together the core research team: the scientists in charge and senior researchers from all four partner institutions at a single location and for a full week where they would collaborate in an informal atmosphere. They would use the event to discuss, brainstorm, exchange information and ideas on emerging research topics, review the main recent research results of their groups, and use this information to plan and drive future project development and allocation of novel research topics across available young researchers. However, it was impossible to create the environment for brain-storming weeks to proceed in an online format.

Project management board comprising project coordinator, project manager and WP leaders (which are scientists in charge from all four institutions) had no option but to cancel the second brain-storming week until its organisation becomes possible, conditioned on the removal of travel restrictions imposed by COVID-19. However, two mitigation measures are agreed:

- To set up one or more Project management board meetings in order to further discuss the main project evolution questions that would have otherwise been resolved during the brain-storming week. The main such question is the one of planning of ongoing and future research collaboration topics between the ICONIC centre researchers and the EU partners, focusing on the involvement of ICONIC early-stage researchers (ESRs).
- To mitigate and replace the impact of brain-storming week on knowledge and information exchange among project partners by organising additional project events that could be realised in an online format. For example, instead of organising a single workshop and/or special session during the second project year, the project partners agreed to aim at organising two such events.

Project management board met on several occasions in an online format during early 2021 in order to prepare for the mid-term review meeting and to plan joint research and development activities during the second project year. In addition, it was agreed to aim for applications for two special sessions at international conferences with regional presence in Western Balkan region: European Signal Processing Conference 2022 to be held in Belgrade (Serbia), and BalkanCom 2022 to be held in Sarajevo (Bosnia and Herzegovina).

### 3 Project Workshops and/or Special Sessions

Focused project workshops and/or special sessions are the main form of research-oriented networking and dissemination. Three workshops and/or special sessions are planned during the project duration, once per each project year.

The first special session proposal is submitted and accepted for a 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. The conference attracts world-leading researchers in the field of communications and signal processing, and features leading experts as keynotes and special session organisers. It is particularly 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.

#### **Session 5: Massive IoT: Fundamentals and Applications**

**Time:** Tuesday, Sep. 21, 2021 – 11:20 – 12:40

**Chair:** Cedomir Stefanovic, Aalborg University

##### **On Tree-Algorithms with Free Access, Multipacket Reception, and Successive Interference Cancellation**

Syed Muhammad Ali (Aalborg University, Denmark); Dejan Vukobratović (University of Novi Sad, Serbia); Marko Beko (Universidade de Lisboa and Universidade Lusofona de Humanidades e Tecnologias, Portugal); Čedomir Stefanović (Aalborg University, Denmark)

##### **Information Freshness in Random Access Channels for IoT Systems**

Andrea Munari (German Aerospace Center, Germany); Elif Uysal (Middle East Technical University, Turkey)

##### **Unsourcesd Random Access for the MIMO Channel**

Kirill Andreev and Alexey A. Frolov (Skolkovo Institute of Science and Technology, Russia)

##### **Two-Tier Multi-Rate Slotted ALOHA for OWC/RF-Based IoT Networks**

Milica Petkovic and Dejan Vukobratović (University of Novi Sad, Serbia); Andrea Munari and Federico Clazzer (Institute of Communications and Navigation of the German Aerospace Center, Germany)

**Figure 1.** First H2020 INCOMING special session at BalkanCom 2021

The first INCOMING project special session entitled “Massive IoT: Fundamentals and Applications” is organised by Dr Gianluigi Liva (DLR), Prof. Alexandre Graell i Amat (CHALMERS) and Prof. Cedomir Stefanovic (AAU). The core topic of the session is aligned with the INCOMING project activities in WP2. For more information about the special session, please check the following webpage: [https://www.balkancom.info/2021/ss\\_mmilot.html](https://www.balkancom.info/2021/ss_mmilot.html), with the list of accepted and presented papers available at: <https://www.balkancom.info/2021/sessions.html#s5> and presented in the figure above.



**Figure 2.** Prof. Cedomir Stefanovic (AAU) announces the first H2020 INCOMING special session at BalkanCom 2021

The planning for the second INCOMING special session has been delayed following the delay of the first INCOMING special session. To compensate for cancellation of the second brainstorming week, the Project management board decided to submit proposals for two special sessions during 2021.

The first special session proposal is submitted 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. The special session proposal, entitled Signal Processing and Machine Learning at the Edge for Beyond 5G Radio Access Networks, has been accepted at the 30<sup>th</sup> European Signal Processing Conference EUSIPCO 2022, to be held in Belgrade (Serbia), 29<sup>th</sup> August – 02<sup>nd</sup> September 2022. The special session organisers are Prof. Dejan Vukobratovic (ICONIC, UNS, Serbia) and Dr Xavier Mestre (CTTC, Spain). The session will feature 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](https://2022.eusipco.org/?page_id=545).

The second special is submitted and accepted at the BalkanCom 2022 conference to be held in Sarajevo (Bosnia and Herzegovina) on 22<sup>nd</sup> – 24<sup>th</sup> August, 2022. The session entitled Massive Internet of Things and Edge Computing is organised by Prof. Cedomir Stefanovic (AAU) and Prof. Dejan Vukobratovic (ICONIC, UNS). The details about the special session are available at: <https://www.balkancom.info/2022/cfp-special-01.html>.

## 4 Dissemination and Outreach to Wider Community

Dissemination and outreach to wider community is done via following channels.

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

- organization of project workshops and special sessions (see 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 and the Twitter page of ICONIC centre (<https://twitter.com/centreiconic>),
- 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.).

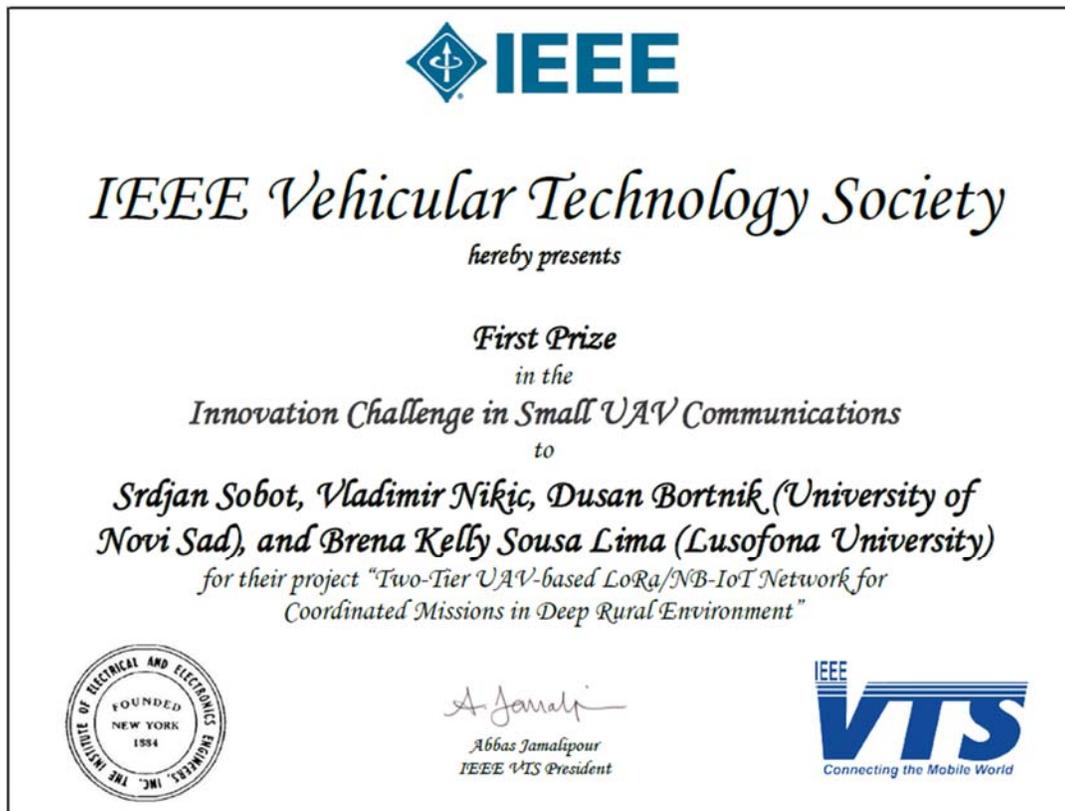
*The innovation dissemination* will be mainly done through 5G-IT-Hub, the projects window towards local/regional ICT environment. This will be coordinated by ICONIC staff through WP4 activities and under leadership of Innovation Manager and 5G-IT-Hub administrator.

More details on 5G-IT-Hub dissemination and outreach activities can be found in companion Deliverable D4.1.

Among the highlights of dissemination and outreach activities during 2021, we provide a following non-exhaustive list of actions:

- January 2021: Dr Dejan Vukobratovic, director of ICONIC centre, served as a Guest Editor for Elsevier Physical Communications journal, special issue on Architecture, Protocols and Management of Indoor Wireless Networks. For more information, please check: <https://www.journals.elsevier.com/physical-communication/call-for-papers/special-issue-on-architecture-protocols-and-management>
- March 2021: H2020 INCOMING project served as an initiating platform for another special issue call in relevant research journal. Dr Andrea Munari (DLR) and Prof. Dejan Vukobratovic (ICONIC, UNS) teamed up with Dr Nurul Huda Mahmood (Oulu University, 6G flagship) to organise a special issue on Massive Machine Type Communications Towards 6G published in MDPI Sensors open access journal. For more information, please check: [https://www.mdpi.com/journal/sensors/special\\_issues/MTC](https://www.mdpi.com/journal/sensors/special_issues/MTC).
- May 2021: Prof. Dragana Bajovic from ICONIC centre gave a lecture at Data Week, an event in organisation of European Big Data Value (EBDV) and Industrial AI research and innovation community. Dr Bajovic presented our activities in the domain of WP3, massive scale information processing, describing ICONIC activities in various EU projects including H2020 INCOMING.
- June 2021: A team of PhD students from ICONIC centre (Srdjan Sobot, Dusan Bortnik and Vladimir Nikic), along with their teammate from University of Lusofona, Lisbon, Portugal (Brena Lima), under the supervision of Dr Milan Lukic and Prof. Dejan Vukobratovic (ICONIC), and Prof. Marko Beko (Uni Lusofona), won the first prize at the IEEE Vehicular

Technology Society UAV Innovation Challenge, ahead of the Georgia State University (USA) and VirginiaTech University (USA).



**Figure 3.** IEEE VTS UAV Innovation Challenge award

- July 2021: ICONIC researchers participated in the TV show Science for Economy broadcasted at the RTV Vojvodina, public TV station with national coverage. The show covers preparation and main ideas of the solution presented at the IEEE VTS UAV Innovation Challenge, where UAVs are deployed in rural mountainous area to provide temporary cellular connectivity to areas without cellular coverage. More information and the entire TV episode is available at: [https://www.youtube.com/watch?v=3\\_Px0hAjpVE](https://www.youtube.com/watch?v=3_Px0hAjpVE).
- September 2021: BalkanCom 2021 conference took place in Novi Sad, between 20<sup>th</sup> and 22<sup>nd</sup> of September. BalkanCom mission is to bring world-class researchers to Balkan region and as such is an ideal platform for promotion of H2020 INCOMING. The ICONIC centre was a visible conference organiser: the conference general chair was Prof. Dejan Vukobratovic, and the project organised a special session on massive IoT as part of the conference program (see Section 3). One of the keynote speakers, Prof. Petar Popovski from AAU, is also an active partner and participant of H2020 INCOMING project.
- October 2021: Prof. Dejan Vukobratovic participated as a Symposia Chair at IEEE Smart Grid Communication 2021 conference in Aachen (<https://sgc2021.ieee-smartgridcomm.org/committees/committee>), Germany. 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. Prof. Dejan Vukobratovic will serve as a TPC Chair for the next conference edition, October 2022 in Singapore, <https://sgc2022.ieee-smartgridcomm.org/committees/committee>.

- December 2021: Prof. Dejan Vukobratovic gave a keynote lecture at International Conference on Future Networks and Distributed Systems (ICFNDS) presenting ICONIC activities in the domain of WP3 – large-scale and distributed information processing. For more information, see: <https://icfnds.org/mod/page/view.php?id=88>.

The main research impact of INCOMING project is achieved through research production in top-tier journals and conferences. INCOMING project will help balancing the research production across different groups of ICONIC centre and cross-fertilization of results, thus connecting the three ICONIC groups into a coherent team.

Based on the adopted definition of publications in high-impact journals presented in deliverable D1.5, we provide below a cumulative list of publications published by ICONIC centre members during the first two years of the project (in 2020 and 2021). For completeness, we repeat what is considered a high-impact publication in the dissemination

*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 and 2021 in journals with impact factor (SCI) with particular emphasis on journals which fall under category of high-impact publications as defined above. We also include 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

### 2022

1. A. Minja and V. Šenk: “SISO Decoding of Z4 Linear Kerdock and Preparata Codes,” **IEEE Transactions on Communications**, Vol. 70, No. 3, pp. 1497-1507, 2022. [within top 30% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
2. 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]
3. 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]

4. 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]
5. N. M. Samardzic, 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]
6. 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]
7. 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]
8. 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]
9. 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]
10. 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. [SCI journal; explicit acknowledgement to H2020 INCOMING project]
11. 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

12. 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]
13. 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]
14. 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 30% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
15. 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]
16. M. Kovačević: “Lattice Packings of Cross-polytopes from Reed-Solomon Codes and Sidon Sets,” **Bulletin of the London Mathematical Society**, 2021. [within top 50% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]

17. 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]
18. 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]
19. 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]
20. Nikolaos A. Androustos, Hector E. Nistazakis, Milica Petkovic, Goran T. Djordjevic, Argyris N. Stassinakis, Christos 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]
21. Milos Savic, Milan Lukic, Dragan Danilovic, Zarko Bodroski, Dragana Bajović, Ivan Mezei, Dejan Vukobratovic, Srdjan Skrbic, Dusan Jakovetić: “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]
22. 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]
23. 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]
24. 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]
25. 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]
26. 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]
27. I. Lazić, 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)**. 31;23(6):698. May 2021 doi: 10.3390/e23060698.[explicit acknowledgement to H2020 INCOMING]

## 2020

28. 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]
29. 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]
30. 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 30% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
  31. 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 30% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]
  32. 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]
  33. 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]
  34. 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]
  35. 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]
  36. 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]
  37. 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]
  38. 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. [within top 50% of SCI journals in the field]
  39. 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. [within top 50% of SCI journals in the field]
  40. 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]
  41. 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]
  42. 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]

43. 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]
44. 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 28 from the listed 44 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 43 % of publications was inspired by the project activities within H2020 INCOMING project (8 out of 17 papers), in 2021 62.5 % (10 out of 16 papers), and in 2022 90 % (10 out of 11 papers).

Besides the listed 2 high impact publications, ICONIC members have published the total of 11 and 19 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 2022, 2021 and 2020.

### **Publications at scientific conferences**

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

#### **2022**

1. 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]
2. 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]
3. I. Lazic, N. Jakovljevic, J. Boban, I. Nosek, T. Loncar-Turukalo: "Information Extraction From Clinical Records: An Example for Breast Cancer", **IEEE MELECON 2022**, Palermo, Italy 2022 [International conference]
4. R. Pernice, I. Lazic, C. Barà, L. Sparacino, G. Mijatovic, T. Loncar-Turukalo, L. Faes: "Assessment of Cardiorespiratory Interactions During Spontaneous and Controlled Breathing: Non-linear Model-free Analysis", **12th conference of European Study Group for Cardiovascular Oscillations**, Štrbské Pleso, Slovakia, October 2022 [International conference]
- 5.

#### **2021**

6. M. Petkovic, T. Devaja, D. Vukobratovic, F. J. Escribano and Č. Stefanović, "Reliability Analysis of Slotted Aloha with Capture for an OWC-based IoT system," **2021 17th International Symposium on Wireless Communication Systems (ISWCS)**, pp. 1-6, Berlin, Germany (virtual event), 2021. [International conference; explicit acknowledgement to H2020 INCOMING project]

7. Milan Lukic, Srdjan Sobot, Ivan Mezei, Dejan Vukobratovic: "3GPP NB-IoT for Smart Environments: Testbed Experimentation and Use Cases," **IEICE Proceeding Series**, Vol. 64, 2021. [International conference; explicit acknowledgement to H2020 INCOMING project].
8. D. Zivojevic, M. Delalic, D. Raca, D. Vukobratovic, M. Cosovic: "Distributed Weighted Least-Squares and Gaussian Belief Propagation: An Integrated Approach," **2021 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm)**, 2021. [International conference]
9. M. Kovačević, D. Vukobratović, "Asymptotics of Constant-Weight Constrained Sequences with Applications," **IEEE Information Theory Workshop (ITW)**, Kanazawa, Japan (virtual event), 2021.
10. S. Dautovic, N. Samardzic, A. Juhas, A. Ascoli, R. Tetzlaff: "Simscape and LTspice models of HP ideal generic memristor based on finite closed form solution for window functions," **28th IEEE International Conference on Electronics, Circuits, and Systems (ICECS)**, Dubai, 2021. [International conference]
11. V. Nikić, D. Bortnik, M. Lukić, I. Mezei, "Firmware Updates Over The Air Using NB-IoT Wireless Technology", **2021 29th Telecommunications Forum (Telfor)**, Belgrade, Serbia, pp. 1-4, 2021. [International conference]
12. D. Bortnik, V. Nikić, M. Lukić, I. Mezei, "Secured by hardware client-server communication based on NB-IoT technology", **2021 Zooming Innovation in Consumer Technologies Conference (ZINC)**, pp. 48-53.[International conference]
13. G. Mijatovic, N. Bozanic, T. Loncar-Turukalo, L. Faes: "Information–theoretic characterization of concurrent activity of neural spike trains," **28th European Signal Processing Conference (EUSIPCO 2020)**, Amsterdam, Netherlands, Jan., 2021 [International conference]

## 2020

14. M. Petkovic, D. Vukobratovic, A. Munari, F. Clazzer: "Relay-aided slotted ALOHA for optical wireless communications," **The 12th International Symposium on Communication Systems, Networks and Digital Signal Processing (CSNDSP 2020)**, Porto (online), July 2020. [International conference; explicit acknowledgement to H2020 INCOMING project]
15. M. Lukic, S. Sobot, I. Mezei, D. Danilovic, D. Vukobratovic: "In-Depth Real-World Evaluation of NB-IoT Module Energy Consumption," **IEEE SmartIoT 2020**, Beijing, China, Aug. 2020, [International conference; explicit acknowledgement to H2020 INCOMING project]
16. V. Ninkovic, D. Vukobratovic, A. Valka, D. Dumic: "Preamble-Based Packet Detection in Wi-Fi: A Deep Learning Approach", **IEEE Vehicular Technology Conference VTC Fall 2020**, Victoria, Canada, Dec. 2020. [International conference; explicit acknowledgement to H2020 INCOMING project]
17. M. Lukic, S. Sobot, I. Mezei, D. Vukobratovic: "3GPP NB-IoT for Smart Environments: Testbed, Experimentation and Use Cases," **IEICE ICTF 2020**, Nis, Serbia, Sept. 2020. [International conference]
18. D. Vukobratovic: "Cellular Internet of Things: Current State of the Art and the Road Ahead", invited paper, **IEICE Int'l Conf on Emerging Technologies for Communications ICETC 2020**, Online Virtual Conference, Dec. 2020. [International conference]
19. S. Sobot, N. Gavric, Z. Bojovic, D. Vukobratovic: "An Overview of Open Source Environments for 5G Internet of Things Experimentation," **ERK 2020**, Portoroz, Slovenia, Oct. 2020. [International conference]

20. J. Machaj, P. Brida, O. Krejcar, M. Petkovic, Q. Shi: "Development of smartphone application for evaluation of passenger comfort," **Asian Conference on Intelligent Information and Database Systems - ACIIDS**, pp. 249-259, Phuket, Thailand, Mar. 2020. [International conference]
21. P. D. Bojovic, I. Basicovic, M. Pilipovic, Z. Bojovic, M. Bojovic: "The rising threat of hardware attacks USB keyboard attack case study," **7th International Conference on Electrical, Electronic and Computing Engineering (IcETRAN 2020)**, Belgrade, 2020. [International conference]
22. N. Krajinovic, N. Avramovic, M. Adzic, Z. Bojovic: "People movement tracking based on estimation of ages and genders," **28th Telecommunications Forum (TELFOR 2020)**, Belgrade (online), Nov. 2020. [International conference]
23. G. Mijatovic, N. Bozanic, T. Loncar-Turukalo: "Investigating Neural Correlations—an Approach to Measure Concurrent Firing Activity," **11th conference of European Study Group for Cardiovascular Oscillations**, Pisa, Italy, July, 2020 [International conference]
24. I. Lazic, T. Loncar-Turukalo, L. Faes: "Information-Theoretic Analysis of Cardiorespiratory Interactions During Apneic Events in Sleep," **11th conference of European Study Group for Cardiovascular Oscillations**, Pisa, Italy, July, 2020 [International conference]
25. M. Pot, Z. Trpovski, T. Loncar –Turukalo: "Performance Analysis of the KMM Digital Image Compression Process," **18th IEEE International Symposium on Intelligent Systems and Informatics (SISY)**, Subotica, Vol. 18, pp. 143-148, Sept. 2020. [International conference]
26. J. Bozickovic, I. Lazic, T. Loncar –Turukalo: "Pneumonia Detection and Classification from X-ray Images – a Deep Learning Approach," **7th International Conference on Electrical, Electronic and Computing Engineering (IcETRAN 2020)**, Belgrade, Novi Sad, Čačak and Niš (online), Sept. 2020. [International conference]

Note that among 43 listed journal papers, one paper is a direct result of joint collaboration between INCOMING partners: ICONIC team from UNS and Chalmers team. Also, among 26 listed conference papers, two papers are a direct result of 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. 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 number of joint journal and conference papers between ICONIC team from UNS and partners is expected to grow in 2022 since mutual research staff visits among INCOMING project partners have been took place since COVID-19 pandemic regulations are relaxed.

## Participation in R&D Activities and Projects

During 2021, 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 2021, 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://fondznanauku.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.

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) 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.