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Innovation and excellence in massive-scale communications and information processing

INCOMING (Project No. 856967)

D6.1: Networking, dissemination and outreach activities including the event list: Year 1¹

Abstract: This document presents a report on the 1st year 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 wider community, to increase presence of ICONIC researchers at flagship conferences in the field, to enhance networking channels of ICONIC researchers via EU partners to wider community, etc. In this deliverable, we describe in detail what has been done during the first project year of H2020 INCOMING. Among most important events, we emphasize a successful Kick-Off meeting and 1st Brainstorming Week (held in early 2020 before COVID-19 restrictions) and significant activities in the domain of public outreach and dissemination events, in particular, events that promoted benefits of emerging and future communication and information processing technologies to future more efficient, productive and smarter societies. We note that, due to COVID-19 pandemic, original plans had to be revised as, starting from March 2020, most of the dissemination and outreach activities 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 (South-Eastern Europe – SEE) domain. The main driver for such activities within the project is Work Package WP6 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 (brain-storming 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 research-oriented networking and dissemination 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:

• **Brain-storming weeks**: The main internal research-oriented networking and dissemination events will be brain-storming weeks. The idea is to gather as many senior researchers from project partner institutions at a single location to a week-long event where they would: 1) present each other their current and future research work, 2) collaborate and exchange ideas in small topical groups, 3) plan and discuss targets and timings of future ER and ESR staff exchanges, 4) interact with ESRs. Four brain storming weeks are planned during the project, the first one at the beginning (jointly with kick-off meeting) and following three towards end of each project year and at a different partner location. The final brainstorming week will be used to plan future collaboration.

• 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 major conferences/events in the domain of 5G communication systems, machine learning and information processing. Three workshops and/or special sessions are planned during the project duration.

• Dissemination and outreach at global and regional events: Research and implementation results produced during the project lifetime will be presented at major IEEE conferences by all members of the consortia. Besides global networking and dissemination, ICONIC staff members will be involved in regional events where they will promote ICONIC centre and INCOMING

project results. Regional visibility will be one of the priority in establishing reputation of the ICONIC centre.

The main purpose of networking and dissemination is to promote project results to wider community, to increase presence of ICONIC researchers at flagship conferences in the field, to enhance networking channels of ICONIC researchers via EU partners to wider community, etc. In the following, we describe what has been done during the first 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 a new circumstance.

2 Kick-Off Meeting and 1st Brainstorming Week

H2020 project INCOMING started on 01st of January 2020. Kick-off meeting has been organized during the first month of the project, together with the 1st Brainstorming Week, in the week of 20th to 24th of January 2020.

The Kick-off Meeting has been organized on 20th of January with the goal of introducing all project partners as well as ICONIC centre researchers about the details of H2020 INCOMING project work plan as well as about the general details and expectation of H2020 WIDENING TWINNING projects. The meeting also included live call with Project Officer and discussion of general goals and expectations from TWINNING projects from the perspective of the project consortium and all Scientists in Charge involved. The meeting proceeded with overview of all Work Packages, description of roles (work package leadership, task leadership), the main milestones and deliverables expected to be delivered during the first project year, etc. Kick-off meeting is attended by most of the ICONIC staff members as well as 7 representatives from 3 project partner institutions (3 from DLR, 2 from CHALMERS and 2 from AAU). Scientists in charge from all three partner institutions were present at the meeting. Two advisory board members were present at the meeting as well as during the Brainstorming week: Prof. Branka Vucetic (The University of Sydney, Australia) and Ivan Seskar (Rutgers University, USA).

After the Kick-Off meeting day, the rest of the week has been allocated to the 1st Brainstorming Week. The event had a format of an informal workshop with representatives of all four involved institutions presenting their recent research results. Each day had a specific topical theme and started by an overview presentation from one of the Scientists in Charge of partner institutions describing their institution, staff members to be involved in the project, their research interests and possibilities for future collaboration within the INCOMING project. The first day included an overview keynote lecture on 5G Machine Type Communications presented by advisory board member Prof. Branka Vucetic. The joint photo from the event is presented below.



Figure 1. Kick-Off Meeting, Novi Sad, 20/01/2020.

The Kick-Off meeting and 1st Brainstorming week agenda is presented on the next page, with more details on the program of each meeting day.

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Monday 20.01	Tuesday 21.01	Wednesday 22.01	Thursday 23.01	Friday 24.01
Kick-Off Meeting Day	Coding and Wireless Day	Information Processing and Machine Learning Day	Design, Development and Implementation Day	Wrapping Up & Mini-Projects Schedule
 09:00 - 10:30 Twinning projects: Basic Facts Reporting Exploitation & Communication Legal Issues Ethical Issues Financial Issues 	09:00 – 09:30 Research Overview AAU 09:30 – 10:10 (Coding) • Gianluigi Liva • Aleksandar Minja 10:10 – 10:40 Coffee break 10:40 – 12:00 (Coding) • Alex Graell i Amat • Mladen Kovacevic • Jelena Bjelica	 09:00 - 09:30 Research Overview CHALMERS 09:30 - 10:10 (Inf Proc & ML) Dragana Bajovic Vukan Ninkovic 10:10 - 10:40 Coffee break 10:40 - 12:00 (InfProc & ML) Mirsad Cosovic Ognjen Kundacina Dejan Vukobratovic 	09:00 – 09:30 Research Overview DLR 09:30 – 10:10 (Wirel. Implem.) • Marcel Grec • Tijana Devaja 10:10 – 10:40 Coffee break 10:40 – 12:00 (Wirel. Implem.) • Ivan Mezei • Milan Lukic • Srdjan Sobot	09:00 – 10:00 Open Stage for Open Topics for Research Collaboration 10:00 – 10:30 Coffee break 10:30 – 12:00 Mini-projects and research visits scheduling Concluding Remarks and Goodbye!
10:30 – 11:00 Coffee Break	12:00 – 13:00 Lunch	12:00 – 13:00 Lunch	12:00 – 13:00 Lunch	12:00 – 13:00 Lunch
11:00 – 11:15 Skype Chat with P.O. 11:15 – 11:30 Research Overview ICONIC 11:30 – 12:00 Overview of INCOMING 12:00 – 12:20 WP 2 overview 12:20 – 12:40 WP 3 overview 12:40 – 13:00 Schools & Exp. Training	 13:00 – 14:00 Keynote: Prof. Branka Vucetic 14:00 – 16:00 (Wireless) Beatriz Soret Federico Clazzer Canan Aydogdu Ceda Stefanovic Milica Petkovic 	 13:00 – 15:00 (InfProc & ML) Tatjana Loncar-Turukalo /Niksa Jakovljevic/Ivan Lazic Milos Kudus/Vladimir Petrovic Milos Radosavljevic Stanisa Dautovic/ Natasa Samardzic Nikola Gavric/Zivko Bojovic 	 13:00 – 14:00 (InfProc & ML implementation) Dragisa Miskovic Rastislav Struharik/Predrag Teodorovic/Vuk Vranjkovic 14:00 – 15:00 Open Stage for Open Topics for Research Collaboration 	
13:00 – 14:30 Lunch Break		19:00 – 21:00 Social Event		
14:30 – 14:50 WP 4 overview 14:50 – 15:10 WP 5 overview 15:10 – 15:30 WP 6 overview 15:30 – 16:00 Workshops & 5G Seminars 16:00 Closing Remarks				

3 Project Workshops and/or Special Sessions

The main form of research-oriented networking and dissemination towards wider community is planned to be in the form of focused workshops and/or special sessions collocated with major conferences/events in the domain of 5G communication systems, machine learning and information processing. Three workshops and/or special sessions are planned during the project duration, once per each project year.

During the initial stage of the project, the Project Management Board decided among several candidates to submit proposal for the first special session as part of BalkanCom 2020 conference that was supposed to be held in Novi Sad, in June 2020 (http://www.balkancom.info/2020/). Although rather new conference, it has been conceived by leading academics in the field (Prof. Ian Akyildiz, Prof. Giorgios Giannakis, Prof. Anthony Ephremides and others) from major USA universities as a high-profile event to be held in historic region of Balkans Peninsula in South Eastern Europe that would attract world-leading researchers in the field of telecommunications and signal processing. For this reason, BalkanCom 2020 has been selected as a venue of suitable quality and relevance, while at the same time tied to the region where ICONIC centre and INCOMING project should deliver its main impact.

The special session proposal application, led by Dr Giangluigi Liva (DLR) and adjoined with Prof. Alexandre Graell i Amat (CHALMERS) and Prof. Cedomir Stefanovic (AAU), has been submitted and accepted for this conference under the topic Massive IoT: Fundamentals and Applications (representing a fundamental topic within INCOMING project WP2 research activities). For more information about the special session, please check the following webpage: http://www.balkancom.info/2020/ss mmiot.html, while for the full list of accepted special sessions, please see: http://www.balkancom.info/2020/cfp ss.html.

However, due to unforeseen events and restrictions brought by COVID-19 pandemic, BalkanCom 2020 is postponed, first towards late 2020, and then finally postponed to June 2021. The Steering Committee of this conference insists of making this conference a live and physical event, as they see strong value of BalkanCom in world leading researchers, and in particular those originating from Balkans, coming back to this region annually and sharing their knowledge and initiatives in a direct contact with peer researchers both from the region and outside. Along with the conference, the INCOMING project special session is thus postponed to 2021.

With such evolution of events, it was impossible for the consortium to look for alternatives in order to organize either a workshop or a special session at another suitable conference. However, with proper planning and with possible extension of the project duration, the project will be able to organize three workshop/ special session events during the course of the project. The planning for the second INCOMING workshop is already in place and appropriate workshop/special session submission to a relevant conference will take place during early 2021. In the meantime, we will be finalizing preparations for the first INCOMING special session as part of BalkanCom to be held during 2021.

4 Dissemination and Outreach to Wider Community

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

<u>The research dissemination</u> is under coordination of WP6 lead by DLR and consists of dissemination of project research and development results via: i) organization of project workshops and special sessions (see Section 3), ii) dissemination of project results at high-impact journals and conferences (see Section 5), iii) dissemination of research results via ICONIC (https://iconic.ftn.uns.ac.rs/) and INCOMING project web pages (https://incoming.ftn.uns.ac.rs/), iv) dissemination of project and ICONIC centre achievements through LinkedIn (https://www.linkedin.com/company/28752451) and Twitter (https://twitter.com/centreiconic), v) 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 schools visits, media press releases, etc.).

<u>The innovation dissemination</u> 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. Through frequent showcases, ICONIC will present the demo outcomes of INCOMING project in 5G-IT-Hub sessions and seminars. More details on 5G-IT-Hub dissemination and outreach activities can be found in companion Deliverable D4.1.

We note that, during initial months of COVID-19 pandemic, a large number of non-scientific theories appeared among other things bringing into connection the deployment of 5G cellular networks and the origin of pandemic. ICONIC centre staff were always motivated and interested to join the scientific debate on such unfounded claims, as evidenced by a number of media appearences in the list below. The scientific population is also addressed through participation of ICONIC staff members at conferences, workshops and dissemination events as invited or keynote speakers. Among the highlights of dissemination and outreach activities during 2020, we provide a following non-exhaustive list of actions:

- January 2020: As part of the TV show "Science for Economy", Dr Dejan Vukobratovic, director of ICONIC centre presented ICONIC activities in the domain of modern wireless communication and information processing technologies. This 24-minute-long episode is aired on national TV channel Radio TV of Vojvodina (RTV) and is also available at the TV show YouTube channel: <u>https://www.youtube.com/watch?v=fXAtta5d5_U</u>
- February 2020: DLR as a project partner organized joint DLR-MIT-TUM workshop on Coding and Random Access (http://smalldatanet.com/). This event brought together researchers around the world interested in fundamentals of massive IoT systems. Dr Dejan Vukobratovic of ICONIC centre has been one of the presenters at the workshop. More information at: <u>https://incoming.ftn.uns.ac.rs/dlr-tum-mit-workshop-on-coding-andrandom-access/</u>
- February 2020: Dr Ivan Mezei presented an overview of ICONIC centre research activities in the domain of massive IoT and in particular 3GPP NB-IoT technology as part of his visit and invited talk at CTTC (Catalan Institute of Telecommunications) in Casteldefells near

Barcelona. More information at: <u>https://incoming.ftn.uns.ac.rs/nb-iot-talk-cttc-dr-ivan-mezei/</u>

- March 2020: As part of the Smart City 2020 conference, organized by the city government of Novi Sad, Prof. Dejan Vukobratovic, director of ICONIC centre, presented a keynote talk on 5G technology as underlying technology enabler for Smart Cities and provided overview of research at ICONIC centre to wider audience. This event has been widely covered on regional and national media, and the full video of Prof. Vukobratovic lecture is available at the following YouTube channel: <u>https://www.youtube.com/watch?v=im3iaZ-6eWo</u>
- April 2020: Prof. Dejan Vukobratovic has been interviewed by Al Jazeera Balkans on 5G technology and its possible impacts. The interview is available on this link: https://balkans.aljazeera.net/teme/2020/4/19/vukobratovic-istrazivanja-i-stroga-ogranicenja-garantiraju-sigurnost-5g-mreza
- April 2020: Prof. Dejan Vukobratovic was guest in a TV show "Kontekst", along with two world known 5G researchers originally from Balkans region, Prof. Petar Popovski (AAU) and Prof. Haris Gacanin (RWTH Aachen), on Al Jazeera Balkans TV program available on this link: <u>https://balkans.aljazeera.net/program/kontekst/2020/4/23/kontekst-5g-teorijezavjere-i-digitalizacija</u>



Figure 2. Announcement for TV show Kontekst (Al Jazeera Balkans TV)

• April 2020: Prof. Dejan Vukobratovic was guest in a TV show "Medju Nama" on a national-level TV Nova S (a part of CNN network) talking about 5G tehnology and benefits

to the society expected from its introduction. The part of the TV show is available on this YouTube link: <u>https://www.youtube.com/watch?v=5ZSB0UAzjBk</u>

- August 2020: Prof. Dejan Vukobratovic presented a keynote lecture reviewing Machine Learning and Distributed Information Processing related activities in ICONIC centre at International Conference on Wireless Communications, Signal Processing and Networking WISPNET 2020, Chennai (India), held online (http://www.wispnet2020.org/)
- September 2020: Prof. Dejan Vukobratovic presented a lecture at Telco Global Forum on Massive IoT technologies (<u>https://www.telcoglobalforum.com/</u>) describing the research in this domain done at the ICONIC centre.
- September 2020: Prof. Dejan Vukobratovic participated in a panel organized as part of Regional Conference on Trends in Telecommunications and Media #DIGITAL 2020: World of Communications After Pandemic (<u>http://digitalconference.rs/en/</u>).
- November 2020: Prof. Dejan Vukobratovic participated at annual TELFOR 2020 conference in Belgrade, Serbia, as part of the panel on 5G Technology as a Service for Society



Figure 3. Announcement for panel at TELFOR 2020 (www.telfor.rs)

- December 2020: Prof. Dejan Vukobratovic presented a keynote lecture at International Conference on Mobile Computing, Wireless Communications and Networks (MCWCN) held in Zhengzhou, China, in online format, reviewing ICONIC centre activities in the domain of massive IoT and in particular 3GPP NB-IoT technology. More details available at: <u>http://www.mcwcn.org/speaker</u>
- December 2020: Prof. Dejan Vukobratovic participated at panel discussion on 5G technology (Myth or Reality of a New Industrial Revolution) as part of European Researchers Night 2020 in neighbouring country of Bosnia and Herzegovina. More details at: <u>http://nocistrazivaca.ba/</u>

The project made a particular effort to make ICONIC as an entity a visible brand. This is achieved through careful visual recognition of ICONIC (logo, webpage, associated 5G-IT-Hub logo and webpage, profiles on social networks such as LinkedIn or Twitter). H2020 INCOMING first newsletter is published in September 2020 indicating the main project achievements during the first 9 months of the project. The newsletter is available at: https://incoming.ftn.uns.ac.rs/wp-content/uploads/2020/09/Newsletter_NO1_September2020_ICONIC.pdf and is communicated to a wide audience through social networking accounts and appropriate email lists.

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5 Dissemination at High Impact Conferences and Journals

The main research impact of INCOMING project will be increased research excellence and research visibility of ICONIC staff members. This will be achieved through increased research production in top-tier journals and conferences such as the ones published by IEEE. 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 list of publications published by ICONIC centre members in 2020. 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 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

D. Jakovetic, <u>D. Bajovic</u>, 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, Nov. 2020. [Flagship IEEE journal within top 10% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]

<u>M. Petkovic</u>, A. Cvetkovic, <u>M. Narandzic</u>, N. Chatzidiamantis, <u>D. Vukobratovic</u>, 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, Oct 2020. [IEEE journal within top 30% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]

<u>M. Radosavljevic</u>, Z. Xiong, L. Lu, D. Hohl, <u>D. Vukobratovic</u>: "High Bit-Depth Seismic Data Compression: A Novel Codec Under the Framework of HEVC," **IEEE Access**, Vol. 8, pp. 114443-114459, June 2020. [IEEE journal within top 30% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]

<u>M. Radosavljevic, B. Brkljac</u>, P. Lugonja, V. Crnojevic, Z. Trpovski, Z. Xiong, <u>D. Vukobratovic</u>: "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, May 2020. [within top 30% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]

Y. Sakai, V. Y. F. Tan, <u>M. Kovačevic</u>: "Second- and Third-Order Asymptotics of the Continuous-Time Poisson Channel," **IEEE Transactions on Information Theory**, Vol. 66, No. 8, pp. 4742-

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4760, Aug. 2020. [IEEE journal within top 30% of SCI journals in the field; explicit acknowledgement to H2020 INCOMING project]

N. Krklec Jerinkic, D. Jakovetic, N. Krejic, <u>D. Bajovic</u>: "Distributed Second-Order Methods With Increasing Number of Working Nodes," **IEEE Transactions on Automatic Control**, Vol. 65, No. 2, pp. 846-853, Feb. 2020. [within top 30% of SCI journals in the field]

M. Panic, D. Jakovetic, <u>D. Vukobratovic</u>, V. Crnojevic, A. Pizurica: "MRI Reconstruction using Markov Random Field and Total Variation as Composite Prior," **Sensors**, Vol. 20, No. 11, pp. 1-15, June 2020. [within top 30% of SCI journals in the field]

P. Tonkovic Petar, S. Kalajdziski, E. Zdravevski, P. Lameski, R. Corizzo, I. M. Pires, N. Garcia Nuno, <u>T. Lončar-Turukalo</u>, V. Trajkovik: "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]

<u>D. Vukobratovic</u>, F. Escribano: "Adaptive Multi-Receiver Coded Slotted ALOHA for Indoor Optical Wireless Communications," **IEEE Communications Letters**, Vol. 24, No. 6, pp. 1308-1312, June 2020. [IEEE journal]

P. Xiao, S. Cheng, V. Stankovic, <u>D. Vukobratovic</u>: "Averaging is Probably not the Optimum Way of Aggregating Parameters in Federated Learning," **Entropy**, Vol. 22, No. 3, pp. 1-11, March 2020. [within top 50% of SCI journals in the field]

V. Tadić, Z. Kiraly, P. Odry, Z. Trpovski, <u>T. Loncar Turukalo</u>: "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]

M. Pot, Z. Trpovski, <u>T. Loncar -Turukalo</u>: "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]

<u>M. Kovačević</u>: "Signaling to Relativistic Observers: An Einstein–Shannon–Riemann Encounter," **Problems of Information Transmission**, Vol. 56, No. 4, pp. 303-309, Oct. 2020. [SCI journal; explicit acknowledgement to H2020 INCOMING project]

V. Vranjkovic, R. Struharik: "Hardware Acceleration of Sparse Support Vector Machines for Edge Computing," **Elektronika ir Elektrotechnika**, Vol. 26, No. 3, pp. 42-53, 2020. [SCI journal; explicit acknowledgement to H2020 INCOMING project]

<u>S. Dautovic</u>, <u>N. Samardzic</u>, <u>A. Juhas</u>, Takacs Model of Hysteresis in Mathematical Modeling of Memristors, Radioengineering, Vol.29, No.1, pp.147-158, DOI 10.13164/re.2020.0147, ISSN 1805-9600 (online), April 2020. [SCI journal]

I. Mezei: "Evolution of an educational microprocessor", **Computer Applications in Engineering Education**, Vol. 25, No. 5, pp. 1265-1277, Aug. 2020. [SCI journal]

<u>Z. Bojovic</u>, 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, Aug. 2020. [SCI journal]

Note that 7 from the listed 17 high impact publications, are inspired by the project activities within H2020 INCOMING project and they have explicit acknowledgment for INCOMING Project No. 856967. This number of high-impact publications represents an increase as compared to 2019, in which ICONIC researchers produced 7 high-impact publications. Besides the listed 9 high impact publications, ICONIC members have published the total of 3 papers in journals with impact factor

whose position on the SCI list lies between the top 30% and top 50% of all the listed journals in a given research field and for 2020 year. In addition, five papers in SCI journals are also published as indicated in the list above.

Publications at scientific conferences

Additionally, a list of publications presented at international conferences during 2020 by ICONIC centre members are also listed below.

<u>M. Petkovic, D. Vukobratovic, A. Munari, F. Clazzer</u>: "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]

<u>M. Lukic, S. Sobot, I. Mezei</u>, D. Danilovic, <u>D. Vukobratovic</u>: "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]

<u>M. Lukic, S. Sobot, I. Mezei, D. Vukobratovic</u>: "3GPP NB-IoT for Smart Environments: Testbed, Experimentation and Use Cases," **IEICE ICTF 2020**, Nis, Serbia, Sept. 2020. [International conference]

<u>V. Ninkovic</u>, 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]

<u>D. Vukobratovic</u>: "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]

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]

J. Machaj, P. Brida, O. Krejcar, <u>M. Petkovic</u>, 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]

P. D. Bojovic, I. Basicevic, M. Pilipovic, <u>Z. Bojovic</u>, 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, Novi Sad, Čačak and Niš (online), Sept. 2020. [International conference]

N. Krajcinovic, N. Avramovic, M. Adzic, <u>Z. Bojovic</u>: "People movement tracking based on estimation of ages and genders," **28th Telecommunications Forum (TELFOR 2020)**, Belgrade (online), Nov. 2020. [International conference]

G. Mijatovic, N. Bozanic, <u>T. Loncar-Turukalo</u>: "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]

<u>I. Lazic, T. Loncar-Turukalo</u>, L. Faes: "Information-Theoretic Analysis of Cardiorespiratory Interactions During Apneic Events in Sleep," **11th conference of European Study Group for Cardiovascular Oscilllations**, Pisa, Italy, July, 2020 [International conference] M. Pot, Z. Trpovski, <u>T. Loncar – Turukalo</u>: "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]

J. Bozickovic, <u>I. Lazic, T. Loncar – Turukalo</u>,: "Pneumonia Detection and Classification from Xray 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 13 listed conference papers, two of them are direct result of INCOMING Project.

Paper presented at CSNDSP 2020 in July this year (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. This collaboration has been initiated before the project kick-started, during joint attendance of ICONIC and DLR researchers at BalkanCom 2019 conference that took place in Skopje, North Macedonia, in June 2019. Initial ideas sketched during the conference were later extended to a successful international conference paper submission and acceptance.

Unfortunately, during 2020, no mutual research staff visits among INCOMING project partners could take place due to COVID-19 pandemic. Clearly, without research visits and direct collaboration between researchers, the joint research goals of WP2 and WP3 are to some extent compromised, and this development of situation have naturally affected the amount of direct joint publications expected from INCOMING project during the first project year. After becoming apparent that COVID-19 pandemic will stretch during a longer time span, and that there will be no possibilities of mutual visits, the research activities within WP2 and WP3 moved online. About 10 different research teams are formed targeting various research problems in the domain of WP2/WP3. This teams are now operating and reporting their activities on a monthly basis to WP2 and WP3 leaders and this information is continuously updated and available to all project participants as part of the project internal documentation.

Participation in R&D Activities and Projects

During 2020, ICONIC researchers continued to secure funding for their future research and innovation activities. Below, we list most important projects that will involve ICONIC staff members starting from the beginning of 2021. For the full list of projects involving ICONIC staff members, please see: <u>https://iconic.ftn.uns.ac.rs/projects/</u>

- **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) will include information processing group of ICONIC with Dr Tatjana Loncar-Turukalo as Scientist in Charge. More information about the project is available at: <u>https://cordis.europa.eu/project/id/952179</u>.
- **H2020 RIA project MARVEL** (Multimodal extreme scale analytics for smart cities environments) will involve information processing and communication groups of ICONIC with Dr Dragana Bajovic as Scientist in Charge. More information about the project is available at: <u>https://cordis.europa.eu/project/id/957337</u>.

- 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.
- ICONIC student team lead by Srdjan Sobot, and involving two other PhD students of ICONIC Dusan Bortnik and Vladimir Nikic has been awarded 1st prize at IEEE Vehicular Technology Society (VTS) Innovation Challenge in Small Unmanned Aircraft System Communications for Students (https://events.vtsociety.org/vtc2020-fall/authors/vtsinnovation-challenge-for-students/) for their proposed project entitled: "Two-Tier UAVbased NB-IoT Networks for Coordinated Missions in Deep Rural Environments". The team will continue with development of their solution in the Phase 2 of VTS competition.