

45<sup>th</sup>

mipro  
2022  
HYBRID CONVENTION

CALL FOR ~  
PAPERS



mipro  
MIPRO Croatian Society



The 45<sup>th</sup> Jubilee International Convention on Information,  
Communication and Electronic Technology

23 - 27 May 2022 - Opatija, Croatia  
Grand Hotel Adriatic and Hotel Admiral

www.mipro.hr  
mipro@mipro.hr

Papers can be submitted to the following international conferences:

- **SIDE** - Smart Industries and Digital Ecosystems  
Associated workshops: RAB - DT - FI5.0 - CCE
- **MEET** - Microelectronics, Electronics and Electronic Technology
- **OPHO** - Optoelectronics and Photonics
- **DS-BE** - Data Science and Biomedical Engineering
- **CTI** - Telecommunications & Information
- **CE** - Computers in Education
- **CTS** - Computers in Technical Systems
- **CIS-AIS** - Artificial Intelligence Systems
- **RTA** - Robotics Technologies and Applications
- **ISS** - Information Systems Security
- **miproBIS** - Business Intelligence Systems
- **DE-DS** - Digital Economy and Digital Society
- **ICTLAW** - Information and Communication Technology Law
- **EE** - Engineering Education
- **SSE** - Software and Systems Engineering
- **SP** - MIPRO Junior - Student Papers

Accepted and presented papers in English will be submitted for inclusion in the IEEE Xplore Digital Library.

If you need assistance, please contact the appropriate chair:

SIDE	Neven Vrčec	nvrcek@foi.unizg.hr
MEET	Marko Koričić	marko.koricic@fer.hr
OPHO	Vera Gradišnik	vera.gradisnik@riteh.uniri.hr
DS-BE	Karolj Skala	skala@irb.hr
CTI	Željka Car	zeljka.car@fer.hr
CE	Marina Čičin-Šain	marinacs@efri.hr
CTS	Vlado Sruk	vlado.sruk@fer.hr
CIS-AIS	Darko Huljenic	darko.huljenic@ericsson.com
RTA	Bojan Jerbić	bojan.jerbic@fsb.hr
ISS	Stjepan Groš	stjepan.gros@fer.hr
miproBIS	Boris Vrdoljak	boris.vrdoljak@fer.hr
DE-DS	Edvard Tijan	etijan@pfri.hr
ICTLAW	Tihomir Katulić	tkatulic@gmail.com
EE	Predrag Pale	mipro@zesoi.fer.hr
SSE	Tihana Galinac Grbac	tihana.galinac@unipu.hr
SP	Benjamin Kušen	benjamin.kusen@fer.hr

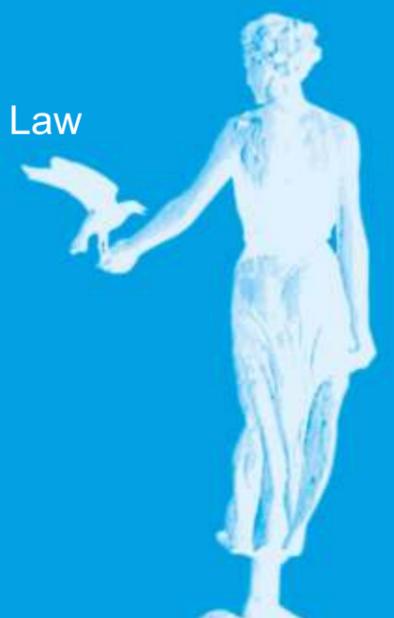
The fee for students (undergraduate and graduate) and secondary school teachers is EUR 120 (without any additional discount). Discount doesn't apply to PhD students.

The registration fee covers free access to all events at MIPRO convention, including the cocktail party on Wednesday.

ICT IN SMART DIGITAL ECOSYSTEMS

*Lampadem tradere*

INNOVATIVE PROMOTIONAL PARTNERSHIP



CONFERENCE  
REGISTRATION FEES:

Early bird (up to 9 May 2022)  
Regular (from 10 May 2022)

	MIPRO and IEEE members	Non-members
	230 EUR	250 EUR
	260 EUR	280 EUR

IMPORTANT  
DATES

Abstract submission: 17 January 2022  
Except SIDE: 7 February 2022

Full-paper submission: 7 February 2022

Acceptance notification: 14 March 2022

Camera ready submission: 28 March 2022

Official languages are English and Croatian. Abstract is limited to 200 words.  
For more information visit [www.mipro.hr](http://www.mipro.hr)



The 45<sup>th</sup> Jubilee International Convention on Information,  
Communication and Electronic Technologywww.mipro.hr  
mipro@mipro.hr23 - 27 May 2022  
Opatija, Croatia

Grand Hotel Adriatic and Hotel Admiral

Welcome to  
OpatijaSUBMIT THE PAPER AND/OR EVENT FOR THE 45<sup>TH</sup> JUBILEE INTERNATIONAL ICT CONVENTION MIPRO 2022!

The 45<sup>th</sup> Jubilee MIPRO 2022 International ICT Convention is traditionally dedicated to information, communication and electronic technology, with links to other high technologies.

MIPRO joins forces with other ICT associations in Croatia and the EU, becoming a hub for communication and cooperation (collaboration). It thus provides an interface for the promotion of knowledge and technology for the participants. The convention will be held under the motto *ICT in Smart Digital Ecosystems*.

We invite you to submit your scientific, technical and review papers for one of our conferences. It is an opportunity to present the results of your research and professional work. Scientific and professional contributions are expected, including papers of PhD students and professional students, novice researchers and specialists, and engineers in development, production and marketing, as well as contributions describing technical, software and hardware solutions. We also expect the papers of experts dealing with education and educational technologies. In particular, we invite the leaders of scientific, research, information and technological European and other projects to present their achievements and experience. We invite all those working in science, education, business and public administration to present their results. *In particular, we would like to present the results of modern digital ecosystems in this era of general digitalization of the economy and society as a whole.*

In addition to the conferences, we also organize educational seminars, round tables, panel discussions, workshops and a traditional exhibition of ICT, electronic and microelectronic products, services and technical solutions. We invite you to present your products and solutions at our and your exhibition.

If you would like to improve and enhance the content of our and your conference with your suggestions and ideas, please contact us at [mipro@mipro.hr](mailto:mipro@mipro.hr). We will be happy to consider your suggestions and facilitate their implementation. The traditional MIPRO convention is at your disposal and would like to present you in the best possible way.

Welcome to the forty-fifth Jubilee International Convention MIPRO 2022 in the always beautiful and hospitable Opatija, a city of tourism, culture, science and new technologies.

CALL FOR  
ADDITIONAL EVENTS

MIPRO is open to all individuals and institutions interested to propose additional events that would enrich MIPRO program.

Interested parties should contact [mipro@mipro.hr](mailto:mipro@mipro.hr) no later than **1 February 2022**.

You can suggest the following events:

- Tutorials
- Round tables and panel discussions devoted to current ICT topics
- Workshops
- Presentations of the eminent economic and scientific institutions
- Invited lectures of eminent scientists, experts and managers
- Legislative discussions on ICT
- Company presentations
- European and promotional activities
- Other events

EXHIBITION OF ICT, ELECTRONIC AND  
MICROELECTRONIC EQUIPMENT,  
TECHNICAL SOLUTIONS AND SERVICES,  
AND PROFESSIONAL LITERATURE:

We hereby invite companies, institutions and ICT experts interested to present their projects and achievements as well as publishers to present their publications. The organizer will provide additional promotional opportunities. Details at [www.mipro.hr](http://www.mipro.hr) or contact [mipro@mipro.hr](mailto:mipro@mipro.hr)

CONFIRMED SMARTY INDUSTRY  
RELATED WORKSHOPS:

- **RAB - Blockchain Application Development and Their Use-Cases**  
Chair: Josip Maričević, [josip.maricevic@tolar.io](mailto:josip.maricevic@tolar.io), Hashnet, Zagreb
- **DT - Digital Twin**  
Chair: Ranko Smokvina, [ranko.smokvina@gmail.com](mailto:ranko.smokvina@gmail.com), Rijeka
- **FI5.0 - Facing the Industry 5.0 – Strategy, Methods and Best Practices**  
Chair: Drago Cmur, [drago.cmur@cadcam-group.eu](mailto:drago.cmur@cadcam-group.eu), CAD/CAM Design Centar, Zagreb
- **CCE - „Correct by Design” - The Competitive Edge with Modern Electrical CAE/CAD/CAM Technologies**  
Chair: Robert Brekalo, [robert.brekalo@hteup.hr](mailto:robert.brekalo@hteup.hr), HT Eurep, Zagreb

## CONFIRMED TUTORIAL (in Croatian):

- **HEP - Information and Communication Technology in the Electric Power Sector**  
Chair: Vitomir Komen, [vitomir.komen@hep.hr](mailto:vitomir.komen@hep.hr), HEP-ODS, Rijeka

## INFO

## General Program Chair:

Academician Karolj Skala, Ruđer Bošković Institute, Bijenička 54, HR-10000 Zagreb, gsm: +385-98-209816, e-mail: [skala@mipro.hr](mailto:skala@mipro.hr)

## Organization and logistics:

MIPRO Office, Jadranski trg 1/II, PO Box 49, HR-51001 Rijeka, Croatia, phone: +385-51-423984, e-mail: [mipro@mipro.hr](mailto:mipro@mipro.hr)

More about Opatija: <http://visitopatija.com>

## ORGANIZER:

MIPRO Croatian Society

## PATRONS:

University of Zagreb  
University of Rijeka  
Juraj Dobrila University of Pula  
Ruđer Bošković Institute, Zagreb  
Jožef Stefan Institute, Ljubljana  
University of Zagreb, Faculty of Electrical Engineering and Computing  
University of Zagreb, Faculty of Organization and Informatics, Varaždin  
University of Rijeka, Faculty of Maritime Studies  
University of Rijeka, Faculty of Engineering  
University of Rijeka, Faculty of Economics and Business  
Josip Juraj Strossmayer University of Osijek, Faculty of Education  
Zagreb University of Applied Sciences  
Croatian Academy of Engineering - HATZ  
Croatian Regulatory Authority for Network Industries - HAKOM  
Ericsson Nikola Tesla, Zagreb  
T-Croatian Telecom, Zagreb  
Končar - Electrical Industries, Zagreb  
HEP - Croatian Electricity Company, Zagreb  
A1 Hrvatska, Zagreb  
HSTec, Zadar

## TECHNICAL CO-SPONSORSHIP:

IEEE Region 8  
IEEE Croatia Section  
IEEE Croatia Section Computer Chapter  
IEEE Croatia Section Electron Devices/Solid-State Circuits Joint Chapter  
IEEE Croatia Section Education Chapter  
IEEE Croatia Section Communications Chapter  
CroSI Association

## INTERNATIONAL PROGRAM COMMITTEE:

K.Skala, General Chair (Croatia), L.Abazi-Bexheti (North Macedonia), E.Afgan (United States), S.Aksentijević (Croatia), S.Aleksić (Germany), S.Amon (Slovenia), K.Antonović (Croatia), Z.Aralica (Croatia), M.E.Auer (Austria), V.Avbelj (Slovenia), D.Babić (Croatia), S.Babić (Croatia), D.Bago (Croatia), T.Bajd (Slovenia), A.Bakić (Croatia), H.Balen (Croatia), M.Banek (Croatia), M.Baranović (Croatia), B.Bebel (Poland), N.Begičević Ređep (Croatia), L.Bellatreche (France), B.Blumenschein (Croatia), D.Boras (Croatia), V.Bosilj Vuksić (Croatia), D.Bosnar (Croatia), A.Boukalov (Belgium), L.Božičević (Croatia), R.Branco (Portugal), Lj.Brkić (Croatia), M.Bubak (Poland), A.Budin (Croatia), Z.Butković (Croatia), P.Campisi (Italy), M.Caputo (Italy), Z.Car (Croatia), J.Carretero Pérez (Spain), B.Cukic (United States), A.Cuzzocrea (Italy), D.Čakara (Croatia), S.Čelar (Croatia), M.Čičin-Sain (Croatia), D.Čišić (Croatia), D.Davidović (Croatia), V.Delić (Serbia), M.Depolli (Slovenia), S.Dešić (Croatia), D.Dragičević (Croatia), T.Eavis (Canada), M.Ferrari (Italy), T.Ferrari (Netherlands), R.Filjar (Croatia), A.Gajović (Croatia), T.Galinac Grbac (Croatia), E.Gallinucci (Italy), D.Gamberger (Croatia), P.Garza (Italy), G.Gledec (Croatia), M.Golfarelli (Italy), S.Golubić (Croatia), V.Gradišnik (Croatia), S.Grazio (Croatia), A.Grgurić (Croatia), S.Groš (Croatia), M.Gulić (Croatia), N.Gumzej (Croatia), M.Gusev (North Macedonia), J.Henno (Estonia), Z.Hocenski (Croatia), T.Holjevac (Croatia), V.Hudek (Croatia), D.Huljenić (Croatia), R.Inkret (Croatia), I.Ipšić (Croatia), M.Ivanda (Croatia), M.Ivašić-Kos (Croatia), Z.Jaakkola (Finland), T.Jaguš (Croatia), V.Jazbinšek (Slovenia), L.Jelenković (Croatia), B.Jerbić (Croatia), D.Jevtić (Croatia), A.Jović (Croatia), A.Jugović (Croatia), A.Jukan (Germany), O.Jukić (Croatia), I.Jurdana (Croatia), O.Jureković (Croatia), M.Jurić (Croatia), Đ.Juričić (Slovenia), N.Kadoić (Croatia), J.M.Kališnik (Slovenia), M.Karuz (Croatia), I.Kaštelan (Serbia), Z.Katalenić (Slovenia), A.Katalinić Mucalo (Croatia), T.Katulić (Croatia), T.Kišasondi (Croatia), Z.Klemenč-Ketiš (Slovenia), D.Kocev (Slovenia), M.Konecki (Croatia), M.Koričić (Croatia), G.Kosec (Slovenia), I.Kotenko (Russia), B.Kovačić (Croatia), Z.Kovačić (Croatia), M.Kozlovsky (Hungary), D.Kragić Jensfelt (Sweden), D.Kranzlmüller (Germany), M.Krašna (Slovenia), L.Krøl Andersen (Denmark), N.Kunštek (Croatia), B.Kušen (Croatia), M.Lacković (Croatia), E.Leitgeb (Austria), J.Lenarčić (Slovenia), T.Lipić (Croatia), H.Lisičar (Croatia), D.Lučić (Croatia), D.Lukač (Germany), I.Ljubi (Croatia), R.Ma (United States), G.Marković (Croatia), L.Martinich (United States), R.Matanovac Vučković (Croatia), L.Matyska (Czech Republic), M.Mauher (Croatia), I.Mekterović (Croatia), Ž.Mihajlović (Croatia), B.Mikac (Croatia), A.Milardović (Croatia), H.Mlinarić (Croatia), M.Mrvelj (Croatia), G.Mudronja (Croatia), N.Nain (India), J.F.Novak (Croatia), V.Olujić (Croatia), P.Pale (Croatia), D.Palová (Slovakia), P.Panov (Slovenia), N.Pavešić (Slovenia), B.Pejčinović (United States), N.Perić (Croatia), A.Perić Hadžić (Croatia), D.Petcu (Romania), J.Petrović (Croatia), D.T.Pham (UK), D.Pintar (Croatia), V.Piuri (Italy), M.Poljak (Croatia), T.Poplas Susić (Slovenia), A.Rashkovska (Slovenia), R.Repnik (Slovenia), L.Révészová (Slovakia), S.Ribarić (Croatia), D.Sabolić (Croatia), I.Sacala (Romania), D.Salamon (Croatia), J.Schulze (Germany), B.Siciliano (Italy), S.Skansi (Croatia), Z.Skočir (Croatia), T.Slapnik (Slovenia), M.Sokele (Croatia), A.Sović Kržić (Croatia), M.Spremić (Croatia), M.Srbić (Croatia), V.Sruk (Croatia), U.J.Stanić (Slovenia), M.Stipčević (Croatia), N.Stojčić (Croatia), V.Strahonja (Croatia), T.Suligoj (Croatia), A.Szabo (Croatia), M.Ščulac Domac (Croatia), D.Simunić (Croatia), F.Škopljanc-Maćina (Croatia), D.Skvorc (Croatia), Z.Sojat (Croatia), A.Spernjak (Slovenia), V.Struc (Slovenia), M.Šutina (Croatia), M.Svaco (Croatia), V.Svedek (Croatia), D.Švelec (Croatia), Z.H.Tan (Denmark), N.Tanković (Croatia), A.Teixeira (Portugal), E.Tijan (Croatia), A.M.Tjoa (Austria), I.Tomašić (Sweden), M.Tomić (Croatia), R.Trobec (Slovenia), M.Varga (Croatia), L.Vejmelka (Croatia), D.Verdnik (Croatia), M.Veselko (Slovenia), L.Vicković (Croatia), I.Vidaković (Croatia), M.Vidas-Bubanja (Serbia), M.Vidović (Croatia), S.Vidović (Croatia), D.Vinko (Croatia), E.Vlačić (Croatia), G.Vojković (Croatia), M.Vranić (Croatia), M.Vrankić (Croatia), N.Vrček (Croatia), B.Vrdoljak (Croatia), Y.Wang (Canada), M.Weber (Croatia), R.Wyrzykowski (Poland), K.Zimmer (Croatia)