



UNIVERSITY OF ZAGREB
FACULTY OF
ORGANIZATION
AND INFORMATICS
V A R A Ž D I N



ISSN 1847-2001 (Print)
ISSN 1848-2295 (Online)

Central European **CONFERENCE** on Information and Intelligent Systems

Proceedings

36th International Scientific Conference



Organized by:
University of Zagreb
Faculty of Organization and Informatics

September 17-19/2025
Varaždin, Croatia

ISSN 1847-2001 (Print)
ISSN 1848-2295 (Online)

UDC 004:007

36th International Scientific Conference

Central European Conference on Information and Intelligent Systems



Proceedings

September 17th – 19th, 2025

Varaždin, Croatia

Organized by:

University of Zagreb

Faculty of Organization and Informatics

Publisher

University of Zagreb Faculty of Organization and Informatics, Pavlinska 2, HR-42000 Varaždin, Croatia

For Publisher

Marina Klačmer Čalopa, University of Zagreb Faculty of Organization and Informatics, Croatia

Editors

Nina Begičević Ređep, University of Zagreb Faculty of Organization and Informatics, Croatia

Marijana Bubanić, University of Zagreb Faculty of Organization and Informatics, Croatia

Contact

E-mail: cecis@foi.unizg.hr

Phone: +385 42 390 848

Web: cecis.foi.hr

Fb: facebook.com/cecis.foi

Editorial Board

Victoria Appatova, University of Cincinnati, USA

Igor Balaban, University of Zagreb, Croatia

Marko Bohanec, Jozef Stefan Institute, Slovenia

Leo Budin, University of Zagreb, Croatia

Aruna Chandra, Indiana State University, USA

Violeta Cvetkoska, University in Skopje, Macedonia

Luis de Marcos Ortega, University of Alcalá, Spain

Blaženka Divjak, University of Zagreb, Croatia

Jasminka Dobša, University of Zagreb, Croatia

Juraj Dud'ak, Slovak University of Technology in Bratislava, Slovakia

Matjaž Garms, Jozef Stefan Institute, Slovenia

Gabriel Gaspar, Slovak University of Technology in Bratislava, Slovakia

Gordan Gledec, University of Zagreb, Croatia

Andrina Granić, University of Split, Croatia

Marjan Heričko, University of Maribor, Slovenia

Dieter Hertweck, Herman Hollerith Research Centre, Germany

Marina Klačmer Čalopa, University of Zagreb, Croatia

Michal Kohani, University of Žilina, Slovakia

Mario Konecki, University of Zagreb, Croatia

Vladimir Kovšca, University of Zagreb, Croatia

Marjan Krašna, University of Maribor, Slovenia

Lode Lauwaert, KU Leuven, Belgium

Sandra Lovrenčić, University of Zagreb, Croatia

Ivan Luković, University of Belgrade, Serbia

Ivan Magdalenić, University of Zagreb, Croatia

Marcelo Fabian Maina, Open University of Catalonia, Spain

Aleksandar Marković, University of Belgrade, Serbia

Peter Marton, University of Žilina, Slovakia

Marta Mas Machuca, UIC Barcelona, Spain

Dunja Mladenič, Jozef Stefan Institute, Slovenia

Oliver Moravčík, Slovak University of Technology, Slovakia

Enrique Mu, Carlow University, USA

Karlo Nyarko, University of Osijek, Croatia

Jan Paralič, Technical University of Košice, Slovakia

Elisabeth Pergler, CAMPUS 02 - University of Applied Sciences, Austria

Krzysztof Podlaski, University of Lodz, Poland

Patrizia Pošćić, University of Rijeka, Croatia

Sonja Ristić, University of Novi Sad, Serbia

Markus Schatten, University of Zagreb, Croatia

Zlatko Stapić, University of Zagreb, Croatia

William Steingartner, Technical University of Kosice, Slovakia

Vjeran Strahonja, University of Zagreb, Croatia

Marko Tadić, University of Zagreb, Croatia

Martina Tomičić Furjan, University of Zagreb, Croatia

Katarina Tomičić Pupek, University of Zagreb, Croatia

Jan Tretmans, Radboud University Nijmegen, Netherlands

Wim Van Petegem, KU Leuven, Belgium

Violeta Vidaček Hainš, University of Zagreb, Croatia

Sirje Virkus, Tallinn University, Estonia

Neven Vrček, University of Zagreb, Croatia

Mladen Vouk, North Carolina State University, USA

Diana Šimić, University of Zagreb, Croatia

Publishing Board

Marko Matus, University of Zagreb Faculty of Organization and Informatics, Croatia

Jelena Gusić Munđar, University of Zagreb Faculty of Organization and Informatics, Croatia

Bernarda Kos, University of Zagreb Faculty of Organization and Informatics, Croatia

Lea Masnec, University of Zagreb Faculty of Organization and Informatics, Croatia

All rights reserved. No parts of this publication may be reproduced, stored in a retrieval system or transmitted in any form by any means, electronic, mechanical photocopying, recording or otherwise without the prior permission of the copyright owner.

CECIIS Proceedings have been indexed in the following databases: ProQuest (SciTech Premium Collection, ProQuest Technology Collection and ProQuest Advanced Technologies & Aerospace database) and Web of Science.

ISSN 1847-2001 (Print)

ISSN 1848-2295 (Online)

**Creative Commons Licence**

Central European Conference on Information and Intelligent Systems Proceedings is licensed under a Creative Commons Attribution-

NonCommercialNoDerivatives 4.0 International License.

<http://creativecommons.org/licenses/by-nc-nd/4.0/>

Contents

Index of Authors	VII
List of Reviewers	IX
Preface	XI
In Memoriam - Prof. Emer. Boris Aurer (1931—2023)	XV

Computer Games

Markus Schatten, Jakov Malović, Ivan Barišić, Antonio Martinaga, Jakov Marčan, Sven Pavlič, Petar Tonković An AI Enhanced Game Master Assistant for Table Top Role Playing Games	3
Markus Schatten, Lara Erdogan, Lana Maček, Tin Muhar, Marin Vabec, Josip Novak Development of a 3D Platformer Game for a Pseudo-Holographic Gaming Console	9
Bogdan Okreša Đurić, Tomislav Peharda, Hrvoje Zema Influencing the Output of a Large Language Model using Defined Personality Trait Facets	17
Tomislav Peharda, Bogdan Okreša Đurić Generative Worldcrafting: A Modular Framework for AI-Assisted Content Creation in Games	23
Marinela Schatten, Ljiljana Inkret-Martinčević, Martina Koščak Play It Safe: Evaluating Participatory Game-Based Learning Activities for Internet Safety Among Primary and Secondary School Students	29

Cyber-Physical Systems and Intelligent Energy

Zvonimir Šimić, Danijel Topić, Marina Dubravac, Nemanja Mišljenović The Potential of Using a Small PV Battery System to Overcome Electricity Supply Disruptions	39
Milan Daňo, Martin Juhás, Patrik Gašparovič, Bohuslava Juhásová, Fedor Burčiar Use of Piezoelectric Technology for Fluid Valves as an Energy Saving Alternative	45
Lukrecia Vulić, Ivan Aleksi, Tomislav Matić Comparative Analysis of Bandpass IIR Filters on Microphone PDM Signal for FPGA Implementation	53
Juraj Ďudák, Juraj Repka Deep-Learning and Stereo Camera Based System for Real-Time Virtual Safety Boundaries	61
Ivan Kolarić, Karlo Pepelnik, Dino Vlahek, Dijana Oreški, Jelena Gusić Munđar, Bojan Žugec, Nikola Kadoić Application of Artificial Intelligence and Internet of Things in Rehabilitation and Health Recovery	69
Lea Masnec, Vjeran Strahonja Modeling and Construction of Circular Economy Digital Twins Based on System Dynamics	79

Data and Knowledge Bases

Ana Petrovic, Danijela Jaksic, Kristian Stancin The Role of Ontologies and Semantic Technologies in Developing Educational Chatbots	89
Mikel Ferrer-Oliva, José Amelio Medina-Merodio, José Javier Martínez-Herraiz, Carlos Cilleruelo-Rodríguez Relational Modelling of Cyberattacks: A Taxonomy for the Analysis of Threat Interactions in Digital Environments	97
Sven Vujević, Maja Cerjan, Kornelije Rabuzin Data Quality in Distributed Information Systems: Conceptual Challenges and Empirical Findings	105
Martina Asenbrener Katic, Sanja Candrljic, Marina Rauker Koch A Case Study on the Two-Sided Version of the Node of Knowledge Conceptual Framework	113
Nađa Klješanović, Sonja Ristić, Darko Stefanović Parallel Utilization of SQL and NoSQL Databases –A Systematic Literature Review	121
Dajana Marnika, Maja Gligora Marković, Božidar Kovačić Unlocking Data Quality for Responsible Artificial Intelligence	131
Ana Pasarić, Patrizia Pošćić, Danijela Jakšić Building Trustworthy Knowledge: Data Quality and Validation Protocols for Educational Knowledge Graphs	139

Designing Innovation through Productive Disruptions

Tamara Ćurlin, Jasmina Pivar Virtual Reality as a Strategic Tool: Adoption Patterns and Distribution Channels in Croatian Hotels	149
Metodija Mircev, Violeta Cvetkoska, Igor Ivanovski Smart Synergies: Open Innovation and Predictive Models in the Telecom-Insurance Ecosystem	157
Aldo Valencia, Violeta Cvetkoska, Bojan Kitanovikj, Alison Pearce Tactile Collaboration and Backcasting to Design Meaningful Futures and Strategies	173
Domagoj Tuličić, Snježana Križanić Digital Twin-Enhanced Fire Response Through Unmanned Aerial Reconnaissance System	183

Digital Transformation and Corporate Culture

Anamarija Zron Impact of Technostress on the Adoption of Artificial Intelligence - A Bibliometric Analysis	193
Krešimir Kavran, Maja Pušnik Planning and Development Processes for the Information System Based on the Command Query Responsibility Segregation Design Pattern	201
Lebohang Nkhabu, Machdel Matthee Barriers to Cyber Hygiene in Hybrid Work Environments: A Case Study of a Lesotho Development Parastatal	213
Daniel Fernando Olmedo Mejía, Violeta Cvetkoska From Human-Centered to Hybrid: Mapping the Emergence of GenAI in Organizational Actor-Networks	221
Zvonimir Vukić Digitalization of Accounting in the 21st Century – A Bibliometric Analysis	229

Anamarija Horvat, Renata Mekovec Protecting privacy on social media platforms: a case study of Croatian users	239
Krešimir Kavran, Boštjan Šumak Indirect User Experience Evaluation: Insights from Employees Working on a Public Sector Information System	247
Igor Pihir, Ivan Kardašić Digital Transformation in the Gaming Industry	259

Innovation, Entrepreneurship and Economic Growth

Antonia Kurtović, Kristina Šorić AI and Simulation in Entrepreneurial Education: Lessons from the RITup Ventures Program	269
Natali Belušić, Kristina Šorić Digitalization of Banking Processes and Adaptation for Elderly People	277
Ivona Kocijan, Kristina Detelj Digital Resilience of SMEs: Conceptual Distinction and Strategic Factors in the Context of Disruptions	283
Walter Rath, Berndt Jesenko, Harris Gerzic Potentials and Barriers of Using Big Data in Austrian SMEs	291
Idoia de Paz Gómez Cultural Factors that Inhibit or Facilitate Innovation in Family Businesses: A Systematic Literature Review	299
Luka Juričinec, Marina Klačmer Čalopa Digital Transformation of HR Practices: A Systematic Review and Bibliometric Analysis of e-HRM Literature / Digitalna transformacija HR prakse: Sustavni pregled i bibliometrijska analiza literature o e-HRM-u	313
Marija Vugrinec, Katarina Pažur Aničić IT project management: Does sustainability matter?	323
Tanja Šestanji-Perić The Influence of Blockchain-based Triple-entry Accounting on Accounting Information – a Theoretical and Conceptual Perspective	339
Ivan Turčić, Ana-Marija Stjepić, Tomislav Jurić Leveling Up Process Efficiency: AI as a Game-Changer for SMEs	345

Intelligent Systems

Ivica Lukić, Tea Krčmar, Dina Šabanović, Miljenko Švarcmajer, Mirko Köhler, Marko Carević Beyond Traditional BI: Large Language Models as Game-Changers in Document Processing	355
Karlo Babić, Ana Meštrović Pyramidal Recursive Composition of Multi-Word Units into Unified Representations	363
Marija Brkić Bakarić, Lucia Načinović Prskalo, Petra Kuljiš Detecting Discrimination Using Selected Data Mining Methods	381
Saša Mitrović, Neven Vrčec Methodology for the comparative analysis of PCA and Autoencoders in dimensionality reduction: impact on classification accuracy and computational efficiency	395

Ivana Kovačević, Ivan Aleksi, Tomislav Matić, Josip Zidar Smart Cuvette: An Integrated Optical System for Ethanol Measurement in Liquid Samples	411
Bojan Radišić, Ivan Dunder, Sanja Seljan Impact of Imputation Methods on the Performance of Classification Algorithms	419
Dominik Čambál, Martin Pukanec, Monika Herchlová, Juraj Ďudák, Matúš Nečas Performance study of a bidirectional vanilla spiking neural network for signal noise suppression	429
Luka Lukač, Damjan Strnad, Štefan Horvat Compressibility of WGANs in a Distributed Learning Environment	433
Marko Vještica, Elena Akik, Vladimir Dimitrieski, Lukas Hinterleitner, Jonas Wieczorek, Jovan Erić, Frank-Christian Weidenfelder Towards User-Centric Chatbot for Q&A in Industry: Evaluation of Employees' Experience	445
Goran Bubaš How ChatGPT and Gemini View the Elements of Communication Competence of Large Language Models: A Pilot Study	455
Dalibor Bužić, Jasminka Dobša Analysis of Popular Croatian Song Lyrics	467

Learning Analytics, AI and Technologies in Education

Vladan Čolić, Enes Sukić The Impact of Text-to-SQL Systems on Student Performance and Satisfaction in SQL Tasks in Higher Education	477
Antoun Yaacoub, Jérôme Da-Rugna, Zainab Assaghir Lightweight Prompt Engineering for Cognitive Alignment in Educational AI: A OneClickQuiz Case Study	489
Maja Kućar, Andreja Brajša-Žganec, Tamara Bolić Children's Screen Time, Preoccupation with Technology, Social Media Use, and Playing Video Games as Possible Predictors of GPA – a Longitudinal Study	497
Caitlin Braga, Adriana Aletta Steyn The AI Classroom: Systematic Literature Insights into Quality and Access in Education	507
Jurica Grzunov, Ljiljana Zekanović-Korona, Zdravko Kunić Attitudes Toward AI in Academic Assessment: A Survey of Croatian Higher Education Teachers	517
Kelebogile M Dibetso, Adriana Aletta Steyn Enhancing Learning Experiences: The role of mixed reality in Higher Education	527
Krešimir Pavlina, Ana Pongrac Pavlina, Anita Modrušan Between Innovation and Reality: Teachers' Attitudes Toward ICT in Teaching	539
Ivana Ružić, Igor Balaban Can We Trust AI in the Classroom? Examining Ethical and Privacy Challenges of LLMs – A Literature Review	549
Goran Hajdin, Igor Balaban, Marko Matus The Dual-Edged Sword: Exploring Student Perceptions and Emotional Responses to AI in Academic Writing	557
Sevgi Koyuncu Tunç Software Standards in Action: A Complaint-Driven Game Inspired by Real Project Failures	565
Daniel Hari, Maja Kerneža, Dejan Zemljak, Andrej Flogie Social Robots and AI-Driven Learning: A Pilot Study on Student Engagement in Higher Education	575

Melita Milić, Blaženka Divjak Exploring Teachers' Acceptance of Digital Textbooks: A Pilot Study in Croatian Primary Schools	581
Mia Šagovac, Dorotea Potoč, Tomislav Jaguš The Impact of Different Game Modes in an Educational Web Application on Student Engagement and Performance	591
Maja Kerneža, Daniel Hari, Andrej Flogie, Dejan Zemljak Disrupting Reading through the Invisible Presence of AI: Rethinking Credibility and Critical Reading in Primary Education	599
Jasenka Begić, Goran Đambić, Ana Lokas Čošković, Vanja Šebek, Ana Tecilazić, Karolina Zelenika Teachers' digital competences and the connection of lifelong learning in higher education	605
Valentina Kirinić, Mihaela Bosak Learning path definition and usage in the context of learning analytics: literature review	615

Strategic Planning and Decision Making

Marta Mas-Machuca, Frederic Marimon, Anna Akhmedova Generative AI and Workplace Productivity: A Qualitative Study in Spain	625
Marta Mas-Machuca, Alba Manresa, Jasmina Berbegal-Mirabent The Impact of Environmental Training on Employee Motivation and Corporate Sustainability in Spanish Companies	633
Predrag Trpeski, Violeta Cvetkoska Bridging Systems, Shaping Futures: A Multilevel Strategy for Curriculum Transformation for Innovation and Resilience in Higher Education	643
Marko Bohanec Using Large Language Models for Creating, Modifying and Interpreting Decision Tables in Multi-Criteria Method DEX	651
Sabina Rako, Nina Begičević Ređep, Barbara Šlibar, Diana Šimić, Bart Rienties Students' Cognitive Engagement in Blended Learning: Observations from Event-contingent Self-report and Log Data	659
Enrique Mu, Anna Florek-Paszowska, Santiago Luis Risco-Martinez Exploring the Impact of Digital Infrastructure Challenges on Learning Outcomes and Student Satisfaction	667
Sanja Kelemen, Nemanja Mišljenović, Goran Knežević, Stjepan Babić Application of Multi-Objective Optimization for Short-Term Operation Planning of an Energy Community	677
Krisztián Attila Bakon, Tibor Holczinger Reactive Scheduling under Due-Date and Intermediate Storage Constraints: A Conceptual Multi-Objective Approach	685
Teresa Monllau, Nikola Kadoić, Enrico Testi, Silvia Sordi, Jaime Lacueva, Ivan Malbašić A conceptual model to assess and develop digitalisation in the social economy's people care sector: the case of Prato (Italy), Mataro (Spain) and Varaždin (Croatia)	693
Nikica Daraboš, Violeta Vidašek Hainš, Nevena Ladić Gender equality in the fields of information and communication technology in healthcare	703
Jin Eun Yoo, Nam-Hwa Kang, Suna Ryu, Jun-ki Lee, Youngsun Kwak, Hyeong Gwan Kim Developing an LLM-specific Coding Framework for Prediction and Feedback Modeling of Science Teachers' Instructional Expertise	711

Systems for Smart Mobility

Dunja Srpak, Josip Srpak, Miljenko Mustapić Application of Internet of Things in urban mobility	723
Sirje Virkus, Marianne Paimre Telepresence Robots as Emerging Technologies in Elderly Care and Wellbeing: The Case of Estonia	731
Mihael Radovan Dynamic Lane Reversal Review	743

Trends in Software Engineering

Boris Tomaš Impact Analysis of Croatian Language as the Publication Language on the Research Paper Visibility and Citation Potential in Computer Science and Engineering / Analiza utjecaja hrvatskog jezika kao jezika publikacije na vidljivost i citiranost znanstvenih radova u području računalnih znanosti i inženjerstva	759
Marija Kuštelega Dark Patterns in the Public Sector: A Study of Cookie Consent Interfaces on Croatian Websites	771
Pablo Hidalgo, Marko Mijač, Adrián Domínguez, Daniel Rodríguez A preliminary Study on the Use of Generative AI in Software Engineering Education	779
Marko Horvat, Barbara Kralj, Gordan Gledec A Comparative Study of Vibe Coding with ChatGPT and Gemini in Front-end Web Development	787
Roberta Capuano, Henry Muccini, Zlatko Stapic Implementing Education 4.0 in Software Engineering Education: the JCC experience	797
Publication Ethics And Malpractice Statement	809
Author Guidelines	813
CECIIS 2025 Sponsors	827
CECIIS 2025 Program and Organizing Committees' Members, Research, Professional Tracks' Chairs and Student Poster and Presentation Section Chair	835

Index of Authors

- Akhmedova, Anna 625
Akik, Elena 445
Aleksi, Ivan 53 ,411
Aničić, Katarina Pažur 323
Assaghir, Zainab 489
Babić, Karlo 363
Babić, Stjepan 677
Bakarić, Marija Brkić 381
Bakon, Krisztián Attila 685
Balaban, Igor 549 ,557
Barišić, Ivan 3
Begić, Jasenka 605
Begičević Redep, Nina 659
Belušić, Natali 277
Berebegal-Mirabent, Jasmina 633
Bohanec, Marko 651
Bolić, Tamara 497
Bosak, Mihaela 615
Braga, Caitlin 507
Brajša-Žganec, Andreja 497
Bubaš, Goran 455
Burčiar, Fedor 45
Bužić, Dalibor 467
Candrlic, Sanja 113
Capuano, Roberta 797
Carević, Marko 355
Cerjan, Maja 105
Cilleruelo-Rodríguez, Carlos 97
Cvetkoska, Violeta 157 ,173 ,221 ,643
Čalopa, Marina Klačmer 313
Čambál, Dominik 429
Čolić, Vladan 477
Čošković, Ana Lokas 605
Ćurlin, Tamara 149
Da-Rugna, Jérôme 489
Daraboš, Nikica 703
Daño, Milan 45
Detelj, Kristina 283
Dibetso, Kelebogile M 527
Dimitrieski, Vladimir 445
Divjak, Blaženka 581
Dobša, Jasminka 467
Domínguez, Adrián 779
Dubravac, Marina 39
Đudák, Juraj 61 ,429
Dunder, Ivan 419
Đambić, Goran 605
Đurić, Bogdan Okreša 17 ,23
EnricoTesti 693
Erdogan, Lara 9
Erić, Jovan 445
Ferrer-Oliva, Mikel 97
Flogie, Andrej 575 ,599
Florek-Paszkowska, Anna 667
Gašparović, Patrik 45
Gerzic, Harris 291
Gledec, Gordan 787
Grzunov, Jurica 517
Gómez, Idoia de Paz 299
Hainš, Violeta Vidašek 703
Hajdin, Goran 557
Hari, Daniel 575 ,599
Herchlová, Monika 429
Hidalgo, Pablo 779
Hinterleitner, Lukas 445
Holczinger, Tibor 685
Horvat, Anamarija 239
Horvat, Marko 787
Horvat, Štefan 433
Inkret-Martinčević, Ljiljana 29
Ivanovski, Igor 157
Jagušt, Tomislav 591
Jaksic, Danijela 89
Jakšić, Danijela 139
Jesenko, Berndt 291
Juhás, Martin 45
Juhásová, Bohuslava 45
Jurić, Tomislav 345
Jurićinec, Luka 313
Kadoić, Nikola 69 ,693
Kang, Nam-Hwa 711
Kardašić, Ivan 259
Katic, Martina Asenbrenner 113
Kavran, Krešimir 201 ,247
Kelemen, Sanja 677
Kerneža, Maja 575 ,599
Kim, Hyeong Gwan 711
Kirinić, Valentina 615
Kitanovikj, Bojan 173
Klještanović, Nađa 121
Knežević, Goran 677
Koch, Marina Rauker 113
Kocijan, Ivona 283
Kolarić, Ivan 69
Kovačević, Ivana 411
Kovačić, Božidar 131
Koščak, Martina 29
Kralj, Barbara 787
Križanić, Snježana 183
Krčmar, Tea 355
Kuljiš, Petra 381
Kunić, Zdravko 517
Kurtović, Antonia 269
Kućar, Maja 497
Kuštelega, Marija 771
Kwak, Youngsun 711
Köhler, Mirko 355
Lacueva, Jaime 693
Ladić, Nevena 703
Lee, Jun-ki 711
Lohaj, Oliver 403
Lukač, Luka 433
Lukić, Ivica 355
Malbašić, Ivan 693
Malović, Jakov 3
Manresa, Alba 633
Marimon, Frederic 625
Marković, Maja Gligora 131
Marnika, Dajana 131
Martinaga, Antonio 3
Martínez-Herraiz, José Javier 97
Marčan, Jakov 3
Mas-Machuca, Marta 625 ,633
Masnec, Lea 79
Matić, Tomislav 53 ,411
Matthee, Machdel 213
Matus, Marko 557
Maček, Lana 9
Medina-Merodio, José Amelio 97

Mejía, Daniel Fernando	Ružić, Ivana 549	Yoo, Jin Eun 711
Olmedo 221	Ryu, Suna 711	Zekanović-Korona, Ljiljana 517
Mekovec, Renata 239	Schatten, Marinela 29	Zelenika, Karolina 605
Meštrović, Ana 363	Schatten, Markus 3 ,9	Zema, Hrvoje 17
Mijač, Marko 779	Seljan, Sanja 419	Zemljak, Dejan 575 ,599
Milić, Melita 581	Sordi, Silvia 693	Zidar, Josip 411
Mircev, Metodija 157	Srpak, Dunja 723	Zron, Anamarija 193
Mitrović, Saša 395	Srpak, Josip 723	Žugec, Bojan 69
Mišljenović, Nemanja 39 ,677	Stancin, Kristian 89	
Modrušan, Anita 539	Stapic, Zlatko 797	
Monllau, Teresa 693	Stefanović, Darko 121	
Mu, Enrique 667	Steyn, Adriana Aletta 507 ,527	
Muccini, Henry 797	Stjepić, Ana-Marija 345	
Muhar, Tin 9	Strahonja, Vjeran 79	
Mundar, Jelena Gusić 69	Strnad, Damjan 433	
Mustapić, Miljenko 723	Sukić, Enes 477	
Nečas, Matúš 429	Šabanović, Dina 355	
Nkhabu, Lebohang 213	Šagovac, Mia 591	
Novak, Josip 9	Šebek, Vanja 605	
Oreški, Dijana 69	Šestanji-Perić, Tanja 339	
Paimre, Marianne 731	Šimić, Diana 659	
Pasarić, Ana 139	Šimić, Zvonimir 39	
Pavlina, Ana Pongrac 539	Šlibar, Barbara 659	
Pavlina, Krešimir 539	Šorić, Kristina 269 ,277	
Pavlić, Sven 3	Šumak, Boštjan 247	
Pearce, Alison 173	Švarcmajer, Miljenko 355	
Peharda, Tomislav 17 ,23	Tecilazić, Ana 605	
Pepelnik, Karlo 69	Tomaš, Boris 759	
Petrovic, Ana 89	Tonković, Petar 3	
Pihir, Igor 259	Topić, Danijel 39	
Pivar, Jasmina 149	Trpeski, Predrag 643	
Potoč, Dorotea 591	Tuličić, Domagoj 183	
Pošćić, Patrizia 139	Tunç, Sevgi Koyuncu 565	
Prskalo, Lucia Načinović 381	Turčić, Ivan 345	
Pukanec, Martin 429	Vabec, Marin 9	
Pušnik, Maja 201	Valencia, Aldo 173	
Rabuzin, Kornelije 105	Virkus, Sirje 731	
Radishevska, Anastasiia 403	Vještica, Marko 445	
Radišić, Bojan 419	Vlahek, Dino 69	
Radovan, Mihael 743	Vrček, Neven 395	
Rako, Sabina 659	Vugrinec, Marija 323	
Rath, Walter 291	Vujević, Sven 105	
Repka, Juraj 61	Vukić, Zvonimir 229	
Rienties, Bart 659	Vulić, Lukrecia 53	
Risco-Martinez, Santiago Luis 667	Weidenfelder, Frank-Christian 445	
Ristić, Sonja 121	Wieczorek, Jonas 445	
Rodriguez, Daniel 779	Yaacoub, Antoun 489	

List of Reviewers

Antonova, Albena, Bulgaria	Jagušt, Tomislav, Croatia	Pesek, Igor, Slovenia
Appatova, Victoria, USA	Janev, Valentina, Serbia	Pihir, Igor, Croatia
Babić, Snježana, Croatia	Jenčik, Marian, Slovakia	Plantak Vukovac, Dijana, Croatia
Babojelić, Karlo, Croatia	Jeremić, Veljko, Serbia	Prenc, Rene, Croatia
Banek Zorica, Mihaela, Croatia	Kadoić, Nikola, Croatia	Pušnik, Maja, Slovenia
Banjanović-Mehmedović, Lejla, Bosnia and Herzegovina	Kaluža, Marin, Croatia	Radošević, Danijel, Croatia
Barač, Dušan, Serbia	Kirinić, Valentina, Croatia	Radaković, Davorka, Serbia
Beliga, Slobodan, Croatia	Koltovska-Nechoska, Daniela, North Macedonia	Radovanović, Sandro, Serbia
Berber, Nemanja, Serbia	Korent, Dina, Croatia	Rienties, Bart, United Kingdom
Bjažić, Toni, Croatia	Kossecki, Paweł, Poland	Ristić, Sonja, Serbia
Bohanec, Marko, Slovenia	Kovacic, Bozidar, Croatia	Rodríguez García, Daniel, Spain
Botički, Ivica, Croatia	Krašna, Marjan, Slovenia	Rožanec, Jože, Slovenia
Brdnik, Saša, Slovenia	Krhač Andrašec, Eva, Slovenia	Sakač, Nikola, Croatia
Buchem, Ilone, Germany	Kučar, Maja, Croatia	Savić, Dušan, Serbia
Bušelić, Vjeran, Croatia	Kušić, Krešimir, Croatia	Schatten, Markus, Croatia
Carrascosa, Carlos, Spain	Kučina Softić, Sandra, Croatia	Sever, Drago, Slovenia
Čakija, Dino, Croatia	Kvet, Michal, Slovakia	Sittar, Abdul, Slovenia
Čandrlić, Sanja, Croatia	Lacković Vincek, Zrinka, Croatia	Stančin, Kristian, Croatia
Calcina, Erik, Slovenia	Luković, Ivan, Serbia	Steyn, Adriana, South Africa
Detelj, Kristina, Croatia	Maina, Marcelo Fabián, Spain	Sturm, Jan, Slovenia
Devčić, Antonela, Croatia	Magdalenić, Ivan, Croatia	Šaloun, Petr, Czechia
Dobrovic, Zeljko, Croatia	Mandić, Milivoj, Croatia	Šarac, Vasilija, North Macedonia
Dolenc, Kosta, Slovenia	Maricic, Milica, Serbia	Taverner, Joaquin, Spain
Domínguez-Díaz, Adrián, Spain	Marolt, Marjeta, Slovenia	Tillmann, Alexander, Germany
Dreven, Nikolina, Croatia	Martí, Pasqual, Spain	Tomaš, Boris, Ireland
Dudak, Juraj, Slovakia	Meštrović, Ana, Croatia	Tomičić Furjan, Martina, Croatia
Dudáš, Adam, Slovakia	Mezak, Jasminka, Croatia	Tomičić, Igor, Croatia
Erjavec, Zlatko, Croatia	Milić, Luka, Croatia	Tomičić-Pupek, Katarina, Croatia
Ferrer Oliva, Mikel, Spain	Mihelič, Jurij, Slovenia	Tokarčíková, Emese, Slovakia
Galinec, Darko, Croatia	Mitrović, Zorica, Serbia	Topal, Oleksandra, Slovenia
Gedrimiene, Egle, Finland	Načinović Prskalo, Lucia, Croatia	Umek, Lan, Slovenia
Gregurec, Iva, Croatia	Novak, Matija, Croatia	Uroda, Ivan, Croatia
Grd, Petra, Croatia	Nyarko, Emmanuel Karlo, Croatia	Van Petegem, Wim, Belgium
Guardia Ortiz, Lourdes, Spain	Okreša Đurić, Bogdan, Croatia	Varga, Michal, Slovakia
Hajdin, Goran, Croatia	Oliveras, Ester, Spain	Vasilj, Josip, Croatia
Hajdarević, Kemal, Bosnia and Herzegovina	Oreški, Dijana, Croatia	Veigend, Petr, Czechia
Hartmann Tolić, Ivana, Croatia	Orehovački, Tihomir, Croatia	Vidović, Ivan, Croatia
Hericko, Marjan, Slovenia	Paralić, Jan, Slovakia	Vrcek, Neven, Croatia
Horvat, Marko, Croatia	Pažur Aničić, Katarina, Croatia	Yaacoub, Antoun, France
Hrkut, Patrik, Slovakia	Pavlina, Krešimir, Croatia	Žajdela Hrustek, Nikolina, Croatia
Hrgarek Lechner, Nadica, Austria	Peharda, Tomislav, Croatia	Žugec, Bojan, Croatia
Ivkovic, Nikola, Croatia	Perčević, Hrvoje, Croatia	Žugec, Petra, Croatia
	Perši, Nenad, Croatia	Zornić, Nikola, Serbia

Preface

We are pleased to present you with the Proceedings of the 2025 Central European Conference on Information and Intelligent Systems. We trust that this compilation will prove to be both valuable and inspiring to you.

Contained within these Proceedings are the full text conference papers from this year's edition of the Central European Conference on Information and Intelligent Systems (CECIIS), an annual international event. This conference is organized by the University of Zagreb Faculty of Organization and Informatics Varaždin, Croatia. It took place from September 17th to 19th, 2025, in Varaždin, Croatia. For over three decades, CECIIS has successfully convened with the aim of serving as an interface between scholars and professionals in the field of information and intelligent systems and related domains.

The 36th CECIIS 2025 conference, with the thematic focus 'Designing Innovation through Productive Disruptions,' aimed to bring together the brightest minds across disciplines to explore how disruptive phenomena can be systematically understood, modelled, and harnessed to drive innovation. By focusing on the interplay between disruptive forces and the mechanisms that transform these forces into productive outcomes, the conference provides a platform for advancing cutting-edge theories, methodologies, and applications that redefine innovation in science, technology, and society. A wide range of topics were discussed at our conference that explore the intersections of disruption and innovation. The exploration of cutting-edge topics like the Science of Disruption, Designing Innovation Systems, Emerging Technologies as Disruptive Forces, Disruptions in Social and Environmental Systems, Metrics, Measurement, and Decision-Making, Educational Paradigms for Disruption.

Although no single event can fully capture the complexity of navigating innovation through disruption, CECIIS 2025 reaffirms our shared commitment to leading change rather than merely reacting to it. Through interdisciplinary collaboration, critical inquiry, and bold experimentation, we are co-creating a future in which disruption is not feared — but designed, directed, and used as a force for good.

It is also pertinent to emphasize that the convergence of Program and Organizing Committee members, academics, and experts from diverse fields allows us to create a cross-disciplinary approach to the conference. This format propels discussions towards topics poised to emerge prominently in the near future, while concurrently facilitating valuable networking among individuals with varied domains of expertise whose collective insights contribute a substantial value to the fabric of CECIIS.

The Proceedings of CECIIS 2025 encompass 86 meticulously reviewed scientific papers. These papers were subject to rigorous peer review by no fewer than two independent evaluators and subsequently endorsed by the international Program Committee. The papers span an array of categories including Computer Games, Cyber-Physical Systems and Intelligent Energy, Data and Knowledge Bases, Designing Innovation through Productive Disruptions, Digital Transformation and Corporate Culture, Innovation, Entrepreneurship and Economic Growth, Intelligent Systems, Learning Analytics, AI and Technologies in Education, Strategic Planning and Decision Making, Systems for Smart Mobility, and Trends in Software Engineering. The selection of these papers hinged upon their relevance, innovativeness, applicability to the information and intelligent systems domain, and overall scholarly merit. The official language of the conference is English.

A total of 98 papers were submitted for review. The review process was carried out through the dedicated efforts of 137 reviewers, about half from Croatia and about half from abroad. Collectively, they completed 194 reviews, leading to the acceptance of 86 papers. These papers, authored by 230 individuals representing 21 countries, are published in this Proceedings. Following the event, a selected group of papers will undergo further review, potentially leading to extended publication in the Journal of Organizational and Information Sciences (JIOS), the international scientific journal published by the University of Zagreb Faculty of Organization and Informatics. Our past Proceedings are indexed in the following bibliographic databases: WoS, Proquest, DOAJ and EBSCO.

A pivotal hallmark of this year's conference were the distinguished invited keynote speakers, individuals whose intellectual contributions have shaped their respective spheres of scientific and professional inquiry. CECIIS 2025 was honored to host the following keynote speakers:

Professor Julius Georgiou, Ph.D., who addressed the topic "Pushing the Boundaries of Modern Key-Enabling Technologies from Research to Innovation", is a Professor of Electrical and Computer Engineering at the Uni-

versity of Cyprus. In his keynote, he explored how silicon-based Key Enabling Technologies (KETs) have led to the development of compact devices that can sense, process, and respond to signals from the body and the environment. He discussed how these technologies progress from research labs to real-world innovations that enhance quality of life, with examples from medical devices and reconfigurable metasurfaces, while also addressing the challenges of translating research into commercial applications.

Professor Dr. Ing. Dennis Kolberg, Ph.D., who presented the topic “Approaches in Software Startups to Foster Innovative Products”, is a professor and head of the Institute for Entrepreneurship and Business Development at the Technical University of Applied Sciences Lübeck (Germany). In his keynote, he highlighted how startups, despite limited resources, often outperform larger companies in delivering disruptive innovations. He explored the unique nature of product management in startup environments, the use of modern innovation practices, and shared early research findings on a startup-specific methodological framework and the evolving role of product managers in the era of AI-driven products.

Multiple IT companies and agencies as FOI partners have actively participated in both the conference program and post-conference events, by organizing workshops and joining panels. This collaboration demonstrates the conference’s strong connection with the IT sector and promotes a crucial exchange of knowledge and experience. This synergy and cooperation between the business sector and the scientific community is key to adapting to change and overcoming challenges in IT and beyond. Marko Mihić, a full professor from the University of Belgrade, Faculty of Organizational Sciences, held a guest lecture within the project Digitalization in entrepreneurship in the context of response to an exogenous shock: Drivers, barriers and impact on firm resilience (DigEntre) on the topic “Digitalization and Digital Transformation of the Economy: Two Sides of the Same Coin”. In addition, Oracle d.o.o. held a thematic workshop titled “Artificial Intelligence and Data Analytics as Support for Innovation and Business Decision-Making.” During the session, participants had the opportunity to explore some of the latest advancements in Oracle’s data analytics platforms and learn how artificial intelligence is shaping the future of decision-making across all industries.

In addition to the scholarly sessions, the conference featured two sections dedicated to posters and presentations, which included 2 scientific research posters and 20 student abstracts, collectively involving 53 authors from 6 nations. These posters added depth and diversity to the intellectual landscape of the conference. The student section was further enriched by two invited lectures. Professor Machdel Matthee from the University of Pretoria delivered a talk on “Digital Disruption, Digital Innovation, and 21st Century Skills,” while Professor Jin Eun Yoo from the Korea National University of Education presented on “Interpretable Machine Learning for the Social Sciences: Revisiting Penalized Regression in Large-Scale Analysis”.

A particularly engaging component of the program was the panel discussion entitled “Smart industry Way Forward”, moderated by Professor Neven Vrčak, Ph.D., from the University of Zagreb Faculty of Organization and Informatics. The panel brought together experts who shared their experiences and best practices in the field of smart industry. They discussed digital transformation, the application of AI and IoT technologies, and strategies that have shaped sustainable development and the future direction of the industry. As part of the event, the Cracker Barrel Session served as an informal, collaborative forum aimed at enhancing decision-making agility in the digital transformation of education within our higher education institution, with a specific focus on integrating AI.

We extend our sincere thanks to all contributors to the Conference program and these Proceedings. This encompasses our esteemed keynote speakers, panelists, authors, reviewers, session chairs, workshop organizers as well as the Program and Organizing Committee members, whose dedication was instrumental. The formidable support rendered by the University of Zagreb Faculty of Organization and Informatics underpins the unequivocal success of the conference.

Lastly, profound appreciation is conveyed to our respected academic and industrial partners, sponsors and donors, whose unwavering support made CECIIS 2025 a resounding achievement. Collaboration with the University of Zagreb Faculty of Transport and Traffic Sciences, University of Zagreb Faculty of Electrical Engineering and Computing, Josip Juraj Strossmayer University of Osijek Faculty of Electrical Engineering, Computer Science and Information Technology, University of Rijeka Faculty of Informatics and Digital Technologies and École supérieure d’informatique, électronique, automatique (ESIEA) was central to the realization of the conference. The financial support from sponsors and donors including Oracle d.o.o., Infodom d.o.o., Financijska agencija d.d. Aircash d.o.o.,

SICK Mobilisis d.o.o., Grad Novi Marof, Hrvatska banka za obnovu i razvitak, Grad Varaždin, Varaždinska županija, Factory X d.o.o., Jadranski naftovod d.d., Grad Čakovec, Međimurska županija, Grad Prelog, Grad Mursko Središće, Stolarija i pilana Ratković, was also invaluable.

In conclusion, it is our sincerest hope that CECIS 2025 provided the participants with enriching and productive experience, and that they will find relevant and interesting papers encompassed in these Proceedings. The enduring connections forged with participants over the years reinforce our commitment to continuous improvement. Anticipation is already building for the forthcoming Central European Conference on Information and Intelligent Systems slated for the autumn of 2026.

September 2025

On the behalf of the Program and Organizing Committees
Full Prof. Nina Begičević Ređep, Ph.D. and Marijana Bubanić, Ph.D
Editors

In Memoriam – Prof. Emer. Boris Aurer (1931—2023)



The University of Zagreb Faculty of Organization and Informatics (FOI) is proud of numerous distinguished individuals who have contributed to the public and scientific life of the institution and the community. On this occasion, we remember prof. emer. Boris Aurer, a long-time president and honorary member of the program committee of the international scientific conference Central European Conference on Information and Intelligent Systems (CECIIS).

Prof. emer. Boris Aurer was born in 1931 in Zagreb. He graduated from the Faculty of Electrical Engineering University of Zagreb in 1957 and received his doctorate in 1972. At the same faculty, he was elected a research associate in 1973, and a senior research associate in 1982. At the Faculty of Science in Zagreb, he was elected an associate professor in 1982, and a scientific research advisor in the field of information sciences in 1989. At the FOI, he was elected a full professor in 1992. He was elected to the permanent scientific and teaching title of full professor in the social scientific and teaching field, the scientific field of information science, in 1999. After his retirement, the Senate of the University of Zagreb elected him to the honorary title of Professor emeritus in 2002.

The scientific and teaching career of prof. emer. Boris Aurer is exceptionally rich. At the Faculty of Electrical Engineering University of Zagreb, he worked as an assistant in the Department of Telecommunications (1959—1962), in the central laboratory of the Siemens company in Munich, he worked on the development of computer systems (1963—1970), in the Institute (IETA) of the RIZ factory in Zagreb, he worked as a head of PCM device development (1970—1973), in the University Computing Center (SRCE) in Zagreb, he worked as a researcher on an international scientific project, then as an assistant director for the computing center and as head of the department for research, teaching and development (1973—1991). He has been working at the FOI since 1991 as an associate professor, and since 1992 as a full professor. He has served as Dean of the FOI for two terms (1995—1997 and 1997—1999).

During his distinguished career, Professor Emeritus Boris Aurer enhanced his professional and scientific skills through a period of advanced study at the Technical University of Delft in the Netherlands (1960—1961), on a professional visit to the development departments and computing centers of the RCA company in the USA (1968), and on a study trip to the USA where he studied their development and computing centers (1983). He participated in international projects of the European Economic Community, known as COST-11 (1973—1987). He was a member of the executive board of the European organization for academic research networks RARE. As the project manager of the Ministry of Science and Technology's project "Architectures and Systems Models for Computer Communications" (1991—1994), he made a significant contribution to the field. He was a member of numerous commissions, working groups and boards.

During his teaching career, he selflessly shared his knowledge with undergraduate and post-graduate students, colleagues and associates at the FOI and other higher education institu-

tions in Croatia. At the FOI, he taught the subjects Information Theory, Computer Systems Architecture and Computer Structure at undergraduate level, and Information Systems Theory and Distributed Systems at postgraduate and doctoral levels. His main areas of research were communication systems and computer networks, as well as security systems in networks and security codes for error detection and correction.

Prof. emer. Boris Aurer, with his commitment, expertise, enthusiasm and intellectual curiosity, influenced the establishment of the CECIIS conference at the international scientific level. He was the president of the program committee of the international symposium Information and communication technologies in office business = Office systems (1994), the international symposium Information Systems, IS (1995—1997), the international conference Information and Intelligent Systems, IIS (1998, 2002—2007), the international conference Central European Conference on Information and Intelligent Systems, CECIIS, (2008—2010) and an honorary member of the program committee of the conference CECIIS (2017—2022).

In addition to the conference, prof. emer. Boris Aurer also influenced the development of the journal of the FOI („Zbornik radova“) which over the years grew into today's international scientific journal, Journal of information and organizational sciences (JIOS). He was the president of the editorial board of the journal (1994—1997), a member of the editorial board (1998—2020), editor-in-chief (1998—1999) and guest editor (2002 (Vol. 26, No.1-2)—2003 (Vol. 27, No. 2)).

For his work, prof. emer. Boris Aurer received the recognition and plaque of the Croatian Information Society (1990), the recognition and plaque of the University of Zagreb for a distinguished professor (1994), the recognition of the Croatian Information Society (1996) and the distinguished of the Order of Danica Hrvatska with the image of Ruđer Bošković (1996).

The work and achievements of prof. emer. Boris Aurer have left a lasting mark on the Faculty of Organization and Informatics as well as in the university, national and international scientific community. Thanks to Professor Aurer's vision of establishing our conference as internationally recognized and a leader in information sciences, the CECIIS conference achieved this status and has maintained its 36-year tradition.

We will remember him as a respected professor, scientist, colleague, and friend.

Bernarda Kos, Master of Informatics, Senior Librarian
University of Zagreb Faculty of Organization and Informatics
Pavlinska 2, Varaždin

CECIIS 2025 Sponsors

CECIIS 2025 GOLD SPONSOR

INFODOM

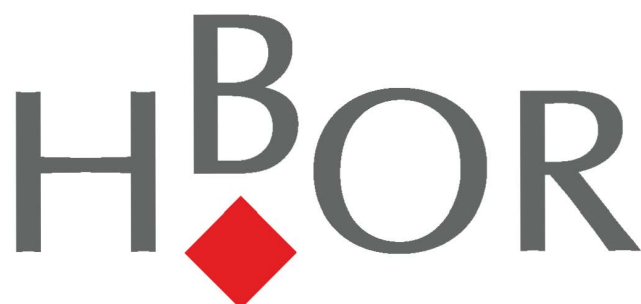
CECIIS 2025 GOLD SPONSOR

The Oracle logo is displayed in a bold, red, sans-serif font. The word "ORACLE" is written in all capital letters, with a registered trademark symbol (®) positioned at the top right of the final letter 'E'.

CECIIS 2025 GOLD SPONSOR



CECIIS 2025 SILVER SPONSORS



HRVATSKA BANKA
ZA OBNOVU I RAZVITAK



CECIIS 2025 SILVER SPONSORS



CECIIS 2025 BRONZE SPONSORS

**VARAŽDINSKA
ŽUPANIJA**



Varaždin County


V A R A Ž D I N
City of Varaždin

SICK
Sensor Intelligence.

CECIIS 2025 Program Committee

Nina Begičević Ređep, Program Committee Chair, University of Zagreb, Croatia	Aleksandar Marković, University of Belgrade, Serbia
Victoria Appatova, University of Cincinnati, USA	Peter Marton, University of Žilina, Slovakia
Igor Balaban, University of Zagreb, Croatia	Marta Mas Machuca, UIC Barcelona, Spain
Marko Bohanec, Jozef Stefan Institute, Slovenia	Dunja Mladenich, Jozef Stefan Institute, Slovenia
Leo Budin, University of Zagreb, Croatia	Oliver Moravčik, Slovak University of Technology, Slovakia
Aruna Chandra, Indiana State University, USA	Enrique Mu, Carlow University, USA
Violeta Cvetkoska, University in Skopje, Macedonia	Karlo Nyarko, University of Osijek, Croatia
Luis de Marcos Ortega, University of Alcalá, Spain	Jan Paralič, Technical University of Košice, Slovakia
Blaženka Divjak, University of Zagreb, Croatia	Elisabeth Pergler, CAMPUS 02 - University of Applied Sciences, Austria
Jasminka Dobša, University of Zagreb, Croatia	Krzysztof Podlaski, University of Lodz, Poland
Juraj Dud'ak, Slovak University of Technology in Bratislava, Slovakia	Patrizia Pošćić, University of Rijeka, Croatia
Matjaž Garms, Jozef Stefan Institute, Slovenia	Sonja Ristić, University of Novi Sad, Serbia
Gabriel Gaspar, Slovak University of Technology in Bratislava, Slovakia	Markus Schatten, University of Zagreb, Croatia
Gordan Gledec, University of Zagreb, Croatia	Zlatko Stapić, University of Zagreb, Croatia
Andrina Granić, University of Split, Croatia	William Steingartner, Technical University of Kosice, Slovakia
Marjan Heričko, University of Maribor, Slovenia	Vjeran Strahonja, University of Zagreb, Croatia
Dieter Hertweck, Herman Hollerith Research Centre, Germany	Marko Tadić, University of Zagreb, Croatia
Marina Klačmer Čalopa, University of Zagreb, Croatia	Martina Tomičić Furjan, University of Zagreb, Croatia
Michal Kohani, University of Žilina, Slovakia	Katarina Tomičić Pupek, University of Zagreb, Croatia
Mario Konecki, University of Zagreb, Croatia	Jan Tretmans, Radboud University Nijmegen, Netherlands
Vladimir Kovšca, University of Zagreb, Croatia	Wim Van Petegem, KU Leuven, Belgium
Marjan Krašna, University of Maribor, Slovenia	Violeta Vidaček Hainš, University of Zagreb, Croatia
Lode Lauwaert, KU Leuven, Belgium	Sirje Virkus, Tallinn University, Estonia
Sandra Lovrenčić, University of Zagreb, Croatia	Neven Vrček, University of Zagreb, Croatia
Ivan Luković, University of Belgrade, Serbia	Mladen Vouk, North Carolina State University, USA
Ivan Magdalenich, University of Zagreb, Croatia	Diana Šimić, University of Zagreb, Croatia
Marcelo Fabian Maina, Open University of Catalonia, Spain	

Honorary Members - Former Program Committee Chairs

Tihomir Hunjak, University of Zagreb, Croatia	Prof. Wolf Rauch, University of Graz, Austria
Mirko Maleković, University of Zagreb, Croatia	Prof. Günter Müller, University of Freiburg, Germany
<u>Boris Aurer, University of Zagreb, Croatia</u>	

CECIIS 2025 Organizing Committee

Marijana Bubanić, Organizing Committee Chair, University of Zagreb, Croatia	Karlo Nadoveza, University of Zagreb, Croatia
Dina Korent, University of Zagreb, Croatia	Martina Đuras Sekovanić, University of Zagreb, Croatia
Marko Matus, University of Zagreb, Croatia	Karlo Pepelnik, University of Zagreb, Croatia
Lea Masnec, University of Zagreb, Croatia	Marija Kuštelega, University of Zagreb, Croatia
Antonela Devčić, University of Zagreb, Croatia	
Jelena Gusić Munđar, University of Zagreb, Croatia	
Bernarda Kos, University of Zagreb, Croatia	

CECIIS 2025 Research Tracks' Chairs

Computer Games: Markus Schatten, University of Zagreb, Croatia; Jaume Jordán Prunera, University Politècnica de València, Spain; Bogdan Okreša Đurić, University of Zagreb, Croatia

Cyber-Physical Systems and Intelligent Energy: Ivan Magdalenic, University of Zagreb, Croatia; Marinko Barukčić, University of Osijek, Croatia; Danijel Topić, University of Osijek, Croatia

Data and Knowledge Bases: Sandra Lovrenčić, University of Zagreb, Croatia; Patrizia Pošćić, University of Rijeka, Croatia

Designing Innovation through Productive Disruption: Neven Vrčec, University of Zagreb, Croatia; Katarina Tomičić-Pupek, University of Zagreb, Croatia

Digital Transformation and Corporate Culture: Katarina Tomičić-Pupek, University of Zagreb, Croatia; Gabriel Gaspar, Slovak University of Technology in Bratislava, Slovakia; Peter Marton, University of Žilina, Slovakia

Innovation, Entrepreneurship and Economic Growth: Vladimir Kovšca, University of Zagreb, Croatia; Martina Tomičić Furjan, University of Zagreb, Croatia

Intelligent Systems: Jasminka Dobša, University of Zagreb, Croatia; Dunja Mladenic, Jožef Stefan Institute, Slovenia

Learning Analytics, AI and Technologies in Education: Blaženka Divjak, University of Zagreb, Croatia; Igor Balaban, University of Zagreb, Croatia; Marjan Krašna, University of Maribor, Slovenia

Strategic Planning and Decision Making: Nina Begičević Ređep, University of Zagreb, Croatia; Nikola Kadoić, University of Zagreb, Croatia

Systems for Smart Mobility: Ivan Magdalenic, University of Zagreb, Croatia; Eduard Ivanjko, University of Zagreb, Croatia

Trends in Software Engineering: Marko Mijač, University of Zagreb, Croatia; William Steingartner, Technical University of Kosice, Slovakia; Luis de Marcos Ortega, University of Alcalá, Spain

CECIIS 2025 Poster Section Chairs

Nina Begičević Ređep, University of Zagreb, Croatia

Dina Korent, University of Zagreb, Croatia

Marijana Bubanić, University of Zagreb, Croatia

CECIIS 2025 Student Poster and Presentation Section Chairs

Violeta Vidaček Hainš, University of Zagreb, Croatia

Victoria Appatova, University of Cincinnati, USA