The 19th International Conference on Informatics in Economy (IE 2020)

Education, Research & Business Technologies

Conference Program

Online Conference
Bucharest, Romania
May 21st, 2020

Conference Organizers

Bucharest University of
Economic Studies

The West University
of Timisoara

Department of Economic Informatics
and Cybernetics

INFOREC Association

Main conference sponsors

QUALITANCE

Editors:
Assoc. Prof. Cristian Ciurea, Bucharest University of Economic Studies, Romania
Prof. Mihaela Muntean, The West University of Timisoara, Romania
Prof. Catalin Boja, Bucharest University of Economic Studies, Romania
Assoc. Prof. Mihai Doinea, Bucharest University of Economic Studies, Romania
Prof. Paul Pocatilu, Bucharest University of Economic Studies, Romania
Assoc. Prof. Lorena Batagan, Bucharest University of Economic Studies, Romania
Assist. Prof. Alin Zamfiroiu, Bucharest University of Economic Studies, Romania
Assist. Prof. Bogdan Iancu, Bucharest University of Economic Studies, Romania

IE 2020 Conference Chair
Acad. Florin Gheorghe Filip, Romanian Academy, Romania

IE 2020 Keynote Speaker
Prof. Wojciech Cellary, Poznan University of Economics, Poland

International Program Committee Members:
Frederique Biennier, INSA de Lion, FRANCE
Wladimir Bodrow, University of Applied Sciences, Berlin, GERMANY
Ewa Bojar, Lublin University of Technology, POLAND
Pino Caballero-Gil, University of La Laguna, SPAIN
Hans Czap, Trier University, GERMANY
Florin Dumitriu, "Al. I. Cuza" University, ROMANIA
Howard Duncan, Dublin City University, IRELAND
Manfred Fischer, Wirtscahftsuniversitaet Wien, AUSTRIA
Janis Grundspenkis, Riga Technical University, LATVIA
Timothy Hall, University of Limerick, IRELAND
Luca Iandoli, University Federico II, ITALY
Ivan Jelinek, Czech Technical University in Prague, CZECH REPUBLIC
Jones Karl, Liverpool John Moores University, UNITED KINGDOM
Karlheinz Kautz, Copenhagen Business School, DENMARK
Wong Wing Keung, National University of Singapore, SINGAPORE
Yannis Manolopoulos, Aristotle University of Thessaloniki, GREECE
Lynn Martin, University of Central England, Birmingham, UNITED KINGDOM
Antonio Jose Mendes, University of Coimbra, PORTUGAL
Mihaela I. Muntean, West University of Timisoara, ROMANIA
Peter Nijkamp, Free University of Amsterdam, NETHERLANDS
Maria Parlinska, Warsaw University of Life Sciences, POLAND
Boris Rachev, Bulgarian Chapter of the ACM, BULGARIA
George Roussos, BirkBeck University of London, UNITED KINGDOM
Gheorghe Silaghi, "Babes-Bolyai" University, ROMANIA
Frantz Rowe, University of Nantes, FRANCE
Doru E Tiliute, "Stefan cel Mare" University of Suceava, ROMANIA
Eduardo Tome, Universida de Lusiada de Famalicao, PORTUGAL
Michael Tschichholz, Fraunhofere Government Center, GERMANY
Giuseppe Zollo, University Federico II, ITALY

Preface

This year, the 19th International Conference on INFORMATICS in ECONOMY (IE 2020), Education, Research & Business Technologies, has been held online in Bucharest, Romania, on 21st May 2020, using Zoom video conference meeting solution. The Conference promoted research results in Business Informatics and related Computer Science topics:
- *IoT, Mobile-Embedded & Multimedia Solutions*
- *E-Society, Enterprise & Business Solutions*
- *Databases & Big Data*
- *Artificial Intelligence, Data-mining & Machine Learning*
- *Quantitative Economics*

The Conference has represented a meeting point for participants from all over the world, both from academia and from industry.

The conference was first organized in 1993 in collaboration with researchers from Institut National des Sciences Appliquées de Lyon (INSA de Lion), France. From 1993 to 2011, the conference has been organized once every two years, publishing in ten editions high quality papers and bringing together specialists from around the world. Starting with 2012, the conference takes place annually, the 11th, 12th, 14th, 15th and 16th edition volumes have been indexed by ISI Thomson Reuters in its ISI Proceedings directory.

Now, the conference proceedings is under evaluation from SCOPUS and will be sent continuously to Clarivate for evaluation and possible indexing.

The International Conference on Informatics in Economy is one of the first scientific events on this subject in Romania and during the last ten years has gained an international scientific recognition. At national level, remains one of the most important scientific events that gather the entire Romanian Economic Informatics community.

The conference has made partnerships with international journals like Journal of Economic Computation and Economic Cybernetics Studies and Research (http://ecocyb.ase.ro), Informatica Economica (http://revistaie.ase.ro), Economy Informatics (http://economyinformatics.ase.ro), Journal of Applied Quantitative Methods (http://www.jaqm.ro), Database Systems Journal (http://www.dbjournal.ro/), Journal of Mobile, Embedded and Distributed Systems (http://www.jmeds.eu) and International Journal of Economic Practices and Theories (www.ijept.org) to publish an extended format of the conference best papers.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Conference Team

Conference Important Events

Thursday, May 21st, 2020		
Time	**Event**	**Hall name**
09:00 – 09:15	**Registration**	Online via Zoom
09:15 – 09:45	**IE 2020 Opening Ceremony** Prof. Alina Mihaela DIMA Vice-Rector, Scientific Research, Development and Innovation Bucharest University of Economic Studies Prof. Marian DARDALA – Dean of the Faculty of Cybernetics, Statistics and Economic Informatics Prof. Mihaela MUNTEAN – The West University of Timisoara	Online via Zoom
09:45 – 10:30	**Challenges of Economy 4.0** Prof. Wojciech CELLARY, Poznan University of Economics, Poland	Online via Zoom
10:30 – 11:15	**The Birth of The Romanian I&CT Sector; A Tribute to Acad. M. Draganescu** Acad. Florin Gheorghe FILIP, Romanian Academy, Romania	Online via Zoom
11:15 – 12:00	**Break**	
12:00 - 15:00	**Paper presentations**	Online Section Rooms

Registered participants will receive customized details regarding accessing Zoom sessions through direct email messages

Conference Presentations Program

IoT, Mobile-Embedded & Multimedia Solutions

1. **A NEW EU CHALLENGE: INCREASE SUPPLY CHAIN MANAGEMENT PERFORMANCE BY INTERNET OF THINGS. A STUDY ON ROMANIAN ECONOMY -** Mircea GEORGESCU, Roxana IBANESCU

2. **THE USAGE OF ADAPTIVE ASSESSMENTS IN THE COMPUTER SCIENCE LEARNING PROCESS: A CASE STUDY FOR JAVA -** Bogdan IANCU

3. **A.I. NEURAL NETWORKS INFERENCE INTO THE IOT EMBEDDED DEVICES USING TINYML FOR PATTERN DETECTION WITHIN A SECURITY SYSTEM -** Cristian TOMA, Marius POPA, Mihai DOINEA

4. **ECONOMIC IMPLICATIONS OF SMARTPHONE APPLICATIONS PROMOTING THE PHYSICAL ACTIVITY -** Felician ALECU, Paul POCATILU, Sergiu CAPISIZU

5. **IOT SECURITY, ASSOCIATED MALWARE TRENDS AND VULNERABILITIES -** Ștefan NICULA, Răzvan Daniel ZOTA

6. **THE IMPACT OF A MULTIMEDIA MOBILE APPLICATION -** Dinu MIHAIL-VĂDUVA

7. **ASSESSMENT OF THE EVOLUTION IN QUALITY FOR XAMARIN ANDROID MULTIMEDIA APPLICATIONS -** Cosmin TOMOZEI

8. **METHODOLOGY FOR EVALUATING IOT SECURITY BASED ON DEVICES BEHAVIOR -** Catalin BOJA

Databases & Big Data

1. **A MODEL OF DATABASE PLATFORM FOR E-COMMERCE APPLICATIONS IN E-SOCIETY** - Loredana MOCEAN, Miranda-Petronella VLAD

2. **FROM ELUSIVE TO UBIQUITOUS: UNDERSTANDING SMART CITIES** - Maria-Alexandra BARINA, Gabriel BARINA

3. **PRACTICAL APPROACH FOR ENERGY MARKET TRADING SIMULATOR** - Anda BELCIU (VELICANU)

4. **PERFORMANCE INDICATORS FOR ANALYSIS OF THE ACTIVITY ON THE WHOLESALE ELECTRICITY MARKET** - Ana Ramona BOLOGA, Anca Ioana ANDREESCU, Dan PREOȚESCU

5. **ICT SOLUTIONS FOR LOCAL FLEXIBILITY MARKETS** - Jin XIAOLONG, Simona-Vasilica OPREA, Adela BÂRA, Vlad DIACONIȚA, Qiuwei WU

6. **ADVANCED DATA ANALYSIS OF SMART GRID CONSUMPTION DATA** - Iuliana ŞIMONCA (BOTHA), Alexandra CORBEA (FLOREA)

Quantitative Economics

1. **QUESTIONS RANKING METHODS BY DETERMINING THEIR DIFFICULTY** - Alin ZAMFIROIU, Ramesh C. SHARMA
2. **DO CREATIVE SOCIETIES INNOVATE MORE? EMPIRICAL EVIDENCE FOR 28 EU MEMBERS** - Raluca Andreea NERIȘANU, Marian Pompiliu CRISTESCU, Miglena STOYANOVA, Julian Andreev VASILEV
3. **THE CYBERNETIC SYSTEM OF THE GLOBAL ECONOMY WITH INFLUENCES OF CLIMATE CHANGE ON THE EVOLUTION OF IT** - Emil SCARLAT, Delia BĂLĂCIAN
4. **THE IMPACT OF TRADE IN GDP PER CAPITA GROWTH IN 2018** - Ionela-Cătălina ZAMFIR
5. **GLOBAL WELL-BEING AND ECONOMIC INEQUALITY** - Irina GEORGESCU, Jani KINNUNEN, Armenia ANDRONICEANU, Ane-Mari ANDRONICEANU
6. **CONCEPTUAL ALGORITHMIC INTERFACE OF THE INFORMATIONAL MANAGEMENT PRECEDENT TO HUMAN MATERIAL ACTIVITIES** - Tudor LEAHU, Sergiu ȘIȘIANU, Alexandr GRECU
7. **INVESTMENT AND CONSUMPTION CHANNELS OF NON KEYNESIAN EFFECTS OF MACROECONOMIC POLICIES. SOME EMPIRICAL STUDIES FOR ROMANIA** - Ana ANDREI, Angela GALUPA, Sorina GRAMATOVICI, Nora CHIRITA, Ionut NICA

Artificial Intelligence, Data-mining & Machine Learning

1. **INFORMATICS METHODS TO INCLUDE LIMIT CONDITIONS INTO AUTOMATED CAPITAL INVESTMENT SOFTWARE SYSTEMS** - Cristian PĂUNA, Ion LUNGU

2. **REDUCING TYPE II ERRORS IN CREDIT CARD FRAUD DETECTION USING XGBOOST CLASSIFIER** - Elena-Adriana MINASTIREANU, Gabriela MESNITA

3. **A STUDY OF ARTIFICIAL NEURAL NETWORKS HYPERPARAMETER TUNING FOR DATA DRIVEN DECISION SYSTEMS** - Adrian-Nicolae BUTURACHE, Stelian STANCU

4. **FINTECH, BIGTECH AND DIGITIZATION IMPACT EVALUATION IN BUSINESS MODELS OF THE BANKS** - Oona VOICAN

5. **RISK MANAGEMENT METHODS FOR COMMERCIAL CREDITS** - Claudia ANTAL-VAIDA

6. **WORD EMBEDDINGS IN ROMANIAN FOR THE RETAIL BANKING DOMAIN** - Irina RAICU, Nicolas BOITOUT, Razvan BOLOGA, Mihai George STURZA

7. **MACHINE LEARNING RISK FACTORS ON THE ROMANIAN STOCK MARKET** - Dan Gabriel ANGHEL

8. **MOBILISING STUDENTS TO FORWARD THINKING OF THEIR STUDIES – PRELIMINARY RESULTS OF A CROWDSOURCING EFFORT** - Jan W. OWSIŃSKI, Cristian CIUREA, Florin Gheorghe FILIP

9. **HIERARCHICAL TEMPORAL MEMORIES IN SECURITY INFORMATION AND EVENTS MANAGEMENT SYSTEMS** - Mihail CAZACU, Constanţa-Nicoleta BODEA

E-Society, Enterprise and Business Solutions

1. **PERCEPTION OVER E-LEARNING TOOLS IN HIGHER EDUCATION: COMPARATIVE STUDY ROMANIA AND MOLDOVA -** Octavian DOSPINESCU, Nicoleta DOSPINESCU

2. **SELF-SERVICE BUSINESS ANALYTICS AND DATA GOVERNANCE -** Mihaela MUNTEAN, Constantin Viorel NEGRUŢ, Florin MILITARU

3. **HOW ROMANIAN IT COMPANIES ADOPTED AGILE PRACTICES AND WHICH ARE THE GENERATED BENEFITS -** Maria Daniela LICA

4. **CLOUD COMPUTING ASPECTS ON KNOWLEDGE MANAGEMENT AND SUPPLY CHAIN -** Ovidiu Alin DOBRICAN

5. **WALLET KEY MANAGEMENT IN BLOCKCHAIN TECHNOLOGY -** Dominic BUCERZAN, Crina Anina BEJAN

6. **E-DEMOCRACY AND E-VOTING USING EMERGING TECHNOLOGIES -** Marian STOICA, Bogdan GHILIC-MICU

7. **ARTIFICIAL INTELLIGENCE POWERS THE DIGITAL TRANSFORMATION FOR ORGANIZATIONS -** Lavinia-Andreea GRUIA, Nicolae BIBU, Alexandru ROJA

8. **THE IMPACT OF INFORMATION TECHNOLOGY ON ENTREPRENEURSHIP -** Amalia FURDUI, Eduard-Victor EDELHAUSER, Elena-Izabela POPA

9. **PRELIMINARY INDICATIONS TRIGGERING OPTIMIZATION OF INTERNAL PROCESSES -** Radu-Eleonor SAMOILĂ

10. **EXPLORING STUDENTS' SATISFACTION WITH AN ACADEMIC PROGRAM. THE CASE OF BUSINESS INFORMATION SYSTEMS SPECIALIZATION -** Doina DĂNĂIAȚĂ, Vasile Daniel PĂVĂLOAIA, Luminița HURBEAN, Doina FOTACHE