2023 August 22^{nd}-24^{th},
İstanbul, Türkiye

INFUS

International Conference on
Intelligent and Fuzzy Systems

Organized by

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INFUS 2023 BOOKLET

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INFUS 2023 Theme:

Intelligent and Sustainable Future

Intelligence can be used in a wide variety of ways to manage environmental impacts and climate change such as clean sustainable supply chains, environmental monitoring and enforcement, and advanced weather and disaster forecasting. The emergence of artificial intelligence (AI) and its growing impact on many industries require research into how it can be used to achieve the Sustainable Development Goals. Applications of AI can create a sustainable and eco-friendly future. AI is a promising tool for the production of new materials that help in building a sustainable environment. The sustainability of biological diversity is another very important problem since many animal species are extinct or endangered. Therefore, intelligence can be used to study animal behavior patterns. Soil pollution is another important problem today as population growth, intensive farming, and other activities increase day by day. Since food production is the key to sustain human life, we can maintain environmental sustainability by monitoring crops and soils and maximize the crop yields, while having less impact on the environment through AI-augmented agriculture. The excessive consumption of natural resources by humans has a detrimental effect on water resources. The level of garbage accumulating in the oceans is higher than ever before.

Artificial intelligence tools should be used to ensure environmental sustainability. Artificial intelligence can be used in automated garbage collection vehicles; It can help solve problems such as illegal fishing and discharge of industrial wastewater into water bodies and illegal dumping of solid wastes into the seas. The use of intelligence for a livable future has become a necessity. A program focusing on intelligence and sustainability future, which is the theme of this year's INFUS 2023 conference, is foreseen. INFUS 2023 aims to bring together the latest theoretical and practical intelligent and fuzzy studies on sustainable future in order to create a discussion environment.

INFUS 2023 Chairs & Committees:

Conference Chair:	Cengiz Kahraman **kahramanc@itu.edu.tr**
Conference Co-Chairs:	Abdullah Cagri Tolga Basar Oztaysi Irem Ucal Sari Selcuk Cebi Sezi Cevik Onar
Vice Co-Chair:	Irem Otay
Local Organizing Committee:	Alize Yaprak Gül Beril Akkaya Eda Bolturk Elif Haktanir Esra Ilbahar Fatma Kutlu Gundogdu Fuat Findikoglu Onur Dogan Murat Gülbay Nursah Alkan Serhat Aydin Zeynep Burcu Kizilkan
Contact Information:	Istanbul Technical University, Department of Industrial Engineering, 34367 Maçka, İstanbul, Türkiye **infus@itu.edu.tr**

Program

DAY 1

August 22nd, 2023

Tuesday

08.45	**Registration**
08.45	**Opening Ceremony**
09.30	**Keynote Speakers** Prof. Janusz Kacprzyk Prof. Krassimir Atanassov
11.00	**Coffee Break**
11.15	**Keynote Speakers** Prof. Irina Perfilieva Prof. Ajith Abraham
12.45	**Lunch**
14.00	**Session 1** (1.1, 1.2, 1.3, 1.4, 1.5)
15.30	**Coffee Break**
15.45	**Session 2** (2.1, 2.2, 2.3, 2.4, 2.5)
17.15	**Coffee Break**
17.30	**Session 3** (3.1, 3.2, 3.3, 3.4, 3.5, 3.6)
19.30	**Cocktail**

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Program

DAY 2

August 23rd, 2023

Wednesday

09.00	**Registration**
09.30	**Keynote Speakers** Prof. Vicenc Torra Prof. Ahmet Fahri Ozok
11.00	**Coffee Break**
11.15	**Session 4** (4.1, 4.2, 4.3, 4.4, 4.5)
12.45	**Lunch**
14.00	**Session 5** (5.1, 5.2, 5.3, 5.4, 5.5)
15.30	**Coffee Break**
15.45	**Session 6** (6.1, 6.2, 6.3, 6.4, 6.5)
17.15	**Coffee Break**
17.30	**Session 7** (7.1, 7.2, 7.3, 7.4, 7.5)
19.15	**Award Ceremony**
20.00	**Gala Dinner**

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Program

DAY 3

August 24th, 2023

Thursday

08.30	Meeting at Beşiktaş İskele
09.00	Bosporus Tour & Closing Ceremony
13.30	Lunch on the Boat
14.30	A Visit to Prince's Islands
19.00	Return to Beşiktaş İskele

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DAY 1

August 22nd, 2023
Tuesday

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Day 1 Highligts

09.00 - 09.30	**Opening Ceremony & Mini Concert** **Chair: Cengiz Kahraman** **Room: Buyukada**
09.30 - 11.00	**Keynote Speakers** **Prof. Janusz Kacprzyk** *“Contextual bipolar database queries: A conjunctive and disjunctive perspective”* **Prof. Krassimir Atanassov** *“Intuitionistic Fuzzy Modal Topological Structures Based on Two New Intuitionistic Fuzzy Modal Operators”* **Chair: Cengiz Kahraman** **Room: Büyükada**
11.15 - 12.45	**Keynote Speakers** **Prof. Irina Perfilieva** *“Multi-Scale Dimensionality Reduction with F-Transforms in Time Series Analysis”* **Prof. Ajith Abraham** *“The World of Generative AI: Challenges and Opportunities”* **Chair: Sezi Cevik Onar** **Room: Büyükada**
19.30 - 21.00	**Welcome Coctail** **Venue: SDKM-Petek Restoran**

DAY 2

August 23rd, 2023

Wednesday

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International Conference on Intelligent and Fuzzy Systems

Day 2 Highligts

09.30 - 11.00	**Keynote Speakers** **Prof. Vicenc Torra** *“Optimal transport and the Wasserstein distance for fuzzy measures: An example”* **Prof. Ahmet Fahri Ozok** *“Mathematics, Scientific Reasoning and Fuzzy Logic”* **Chair: A. Cagri Tolga** **Room: Büyükada**
11.15 - 12.45	**MIGROS & Intelligent Practices in Retail Industry Special Session** **Chair: Cengiz Kahraman** **Room: Buyukada**
11.15 - 12.45	**MIGROS & Intelligent Practices in Retail Industry Special Session** **Chair: Cengiz Kahraman** **Room: Buyukada**
15.45 - 17.15	**Prof. Dr. Esra Albayrak Special Session** **Chair: Gülçin Büyüközkan** **Room: Heybeliada**
20.00 - 23.00	**Gala Dinner** **Venue: İstanbul Üniversitesi Baltalimanı Sosyal Tesisleri**

DAY 3

August 24th, 2023

Thursday

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Day 3 Highligts

08.30 - 09.00	Meeting at Beşiktaş İskele
09.00 - 13.00	Bosporus Tour & Closing Ceremony
13.30 - 14.30	Lunch on the Boat
14.30 - 18.30	Visit to Prince's Islands
18.30 - 19.00	Return to Beşiktaş İskele

Keynote Speakers

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Prof. Janusz Kacprzyk

Polish Academy of Sciences, Poland

Prof. Janusz Kacprzyk is Professor of Computer Science at the Systems Research Institute, Polish Academy of Sciences, WIT – Warsaw School of Information Technology, and Chongqing Three Gorges University, Wanzhou, Chinqgqung, China, and Professor of Automatic Control at PIAP – Industrial Institute of Automation and Measurements. He is Honorary Foreign Professor at the Department of Mathematics, Yli Normal University, Xinjiang, China. He is Full Member of the Polish Academy of Sciences, Member of Academia Europaea, European Academy of Sciences and Arts, Foreign Member of the: Bulgarian Academy of Sciences, Spanish Royal Academy of Economic and Financial Sciences (RACEF), Finnish Society of Sciences and Letters, and Flemish Royal Academy of Belgium of Sciences and the Arts (KVAB). He was awarded with 4 honorary doctorates. He is Fellow of IEEE, IET, IFSA, EurAI and SMIA.

His main research interests include the use of modern computation computational and artificial intelligence tools, notably fuzzy logic, in systems science, decision making, optimization, control, data analysis and data mining, with applications in mobile robotics, systems modeling, ICT etc.

He authored 7 books, (co)edited more than 100 volumes, (co)authored more than 600 papers, including ca. 80 in journals indexed by the WoS. His bibliographic data are: Google Scholar: citations: 28094; h-index: 74, Scopus: citations: citations: 8416; h-index: 40, ResearcherID (M-9574-2014): citations: 9014; h-index=42 and Web of Science: citations: 6696 (5517 without self-citations) h-index: 34.

He is the editor in chief of 7 book series at Springer, and of 2 journals, and is on the editorial boards of ca. 40 journals.. He is President of the Polish Operational and Systems Research Society and Past President of International Fuzzy Systems Association.

Prof. Krassimir Atanassov

Bulgarian Academy of Sciences, Bulgaria

Prof. Krassimir Atanassov is a professor in Institute of Biophysics and Biomedical Engineering at Bulgarian Academy of Sciences. He has been elected Corresponding member of the Bulgarian Academy of Sciences in 2012. He has been awarded the “Pythagoras” Award for considerable contribution to science (Technical Sciences), awarded by the Ministry of Education and Science of Bulgaria in 2013. He is Fellow of the International Fuzzy Systems Association since 2013, Honorary Fellow of the KvB Institute of Technology, Sydney since 2004 and Honorary Associate of the University of Technology, Sydney since 1995.

His main research interests include the theory of Generalized Nets and its applications in the fields of artificial intelligence, medicine, transportation, economy, telecommunications, systems theory, etc., the theory of Intuitionistic Fuzzy Sets and its applications in the fields of artificial intelligence, systems theory, medicine, etc. and the generalized the Fibonacci Sequence, properties of arithmetic functions, extremal and combinatorial problems. Prof. Atanassov is the membership Union of Bulgarian Mathematicians since 1979, American Mathematical Society since 1989, IFAC since 2010, IEEE Computational Intelligence Society since 2011, EUSFLAT since 2013. He is also a member of the editorial board of many journals. Currently Prof. Atanassov is the editor-in-chief of Notes on Intuitionistic Fuzzy Sets, Notes on Number Theory and Discrete Mathematics, Issues in Intuitionistic Fuzzy Sets and Generalized Nets, and Advanced Studies in Contemporary Mathematics.

Prof. Vicenc Torra

Umeå University, Sweden

Prof. Vicenç Torra is currently a professor at Umeå University (Sweden). He is an IEEE and EurAI Fellow. He has written several books including “Modeling decisions” (with Y. Narukawa, Springer, 2007), “Data Privacy” (Springer, 2017), and “Scala: from a functional programming perspective” (Springer, 2017), and edited several books including “Data science in practice” (with A. Said, Springer, 2019) and “Non-additive measures: theory and applications” (with Y. Narukawa and M. Sugeno, Springer, 2014).

His fields of interests include approximate reasoning (fuzzy sets, fuzzy measures/non-additive measures and integrals), decision making, aggregation and integration, data privacy, and machine learning. He regularly participates in program committees in the areas of approximate reasoning and data privacy, and is member of several editorial boards including Transactions on Data Privacy (founder and editor), Fuzzy Sets and Systems, and Progress in Artificial Intelligence. He started in 2004 the annual conference series Modeling Decisions for Artificial Intelligence (MDAI). His web page is: http://www.mdai.cat/vtorra/.

Prof. Ajith Abraham

Machine Intelligence Research Labs, the USA

Ajith Abraham (Senior Member, IEEE) received the B.Tech. degree in electrical and electronic engineering from the University of Calicut in 1990, the Master of Science degree from Nanyang Technological University, Singapore, in 1998, and the Ph.D. degree in computer science from Monash University, Melbourne, Australia, in 2001. He is the Pro-Vice Chancellor at Bennett University, New Delhi, responsible for the University's Research and International Academic Affairs. Prior to this, he was the Dean of Faculty of Computing and Mathematical Sciences at FLAME University, Pune, and the Founding Director of Machine Intelligence Research Labs (MIR Labs), USA, a Not-for-Profit Scientific Network for Innovation and Research Excellence Connecting Industry and Academia. He also held two International University Professorial appointments: Professor of Artificial Intelligence in Innopolis University, Russia, and he was the Yayasan Tun Ismail Mohamed Ali Professorial Chair in Artificial Intelligence of UCSI, Malaysia. He works in a multi-disciplinary environment. He has authored/coauthored more than 1,400 research publications out of which there are more than 100 books covering various aspects of computer science. One of his books was translated into Japanese and a few other articles were translated into Russian and Chinese. He has more than 52,000 academic citations (H-index of more than 107 as Per Google Scholar). He has given more than 150 plenary lectures and conference tutorials (in more than 20 countries). He was the Chair of IEEE Systems Man and Cybernetics Society Technical Committee on Soft Computing (which has over more than 200 members), from 2008 to 2021, and served as a Distinguished Lecturer for IEEE Computer Society representing Europe (2011–2013). He was the Editor-in-Chief of Engineering Applications of Artificial Intelligence (EAAI), from 2016 to 2021, and serves/served on the editorial board for over 15 international journals indexed by Thomson ISI.

Prof. Irina Perfilieva

University of Ostrava, Czech Republic

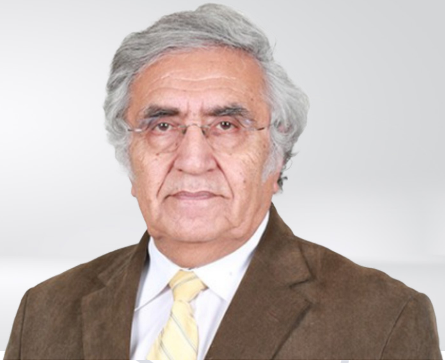
Professor Irina Perfilieva, Ph.D., received the degrees of M.S. (1975) and Ph.D (1980) in Applied Mathematics from the Lomonosov State University in Moscow, Russia. At present, she is full professor of Applied Mathematics in the University of Ostrava, Czech Republic. At the same time she is head of Theoretical Research Department in the Centre of Excellence IT4Innovations, University of Ostrava, Institute for Research and Applications of Fuzzy Modeling.

She is a member of the board of Russian Association on Fuzzy Systems and a member of the Emergent Technology Technical Committee of the IEEE CIS (ETTC).

She is the author or co-author of three books on mathematical principles of fuzzy sets and fuzzy logic, co-editor of one edited monograph and guest editor of many special issues of scientific journals. She published around 200 papers in the areas of multi-valued logic, fuzzy logic, fuzzy approximation, fuzzy relation equations, and image processing. She is member of editorial boards of the journals Fuzzy Sets and Systems, Journal of Computational Intelligence Research, Iranian Journal of Fuzzy Systems, Journal of Uncertain Systems.

She works as a member of Programme Committees of the most prestigious International Conferences and Congresses in the areas of soft computing, fuzzy and knowledge-based systems. She is well recognized as a plenary/invited speaker on various International conferences and congresses.

For her long-term scientific achievements she was awarded in the International Conference on Foundations and Applications of Computational Intelligence FLINS 2010. As an co-author of the software for Time Series forecast, she got a special price of the Seoul International Inventions Fair 2010.



Prof. Ahmet Fahri Ozok

Istanbul Okan University, Türkiye

Prof. Ahmet Fahri Ozok received the B.Sc. degrees in the departments of machine engineering and mathematics from Istanbul Technical University and Istanbul University in 1964 and 1979, respectively. He found as a visiting student at the University of Perugia in Italy, XVI. Louis University in Paris, at Stanford University in the United States. He has served Istanbul Technical University for many years. Currently, he is a professor in Faculty of Engineering and Natural Sciences at Istanbul Okan University.

He is the Founding President of the Ergonomics Association and a member of the German Ergonomics Association, the Turkish Mathematicians Association, the Turkish Operations Research Association, and the Turkish-German Education and Solidarity Foundation. He has received Darmstadt Technical University Scholarship in 1965-1966, TÜBİTAK Domestic PhD Scholarship in 1969-1973, Centro di Studi Italiani Scholarship in 1970, French Government Scholarship in 1973-1974, and Koç Holding Research Scholarship in 1975-197. He has won NATO Human Factors Programme Study Visit Award in 1980 and IEA (International Ergonomics Association) Outstanding Service Award in 2010.

His fields of interests include ergonomics, work study, fuzzy logic. One of his greatest talents is his aptitude for language. He speaks English, French, German, Italian and Spanish.

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