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Engineering
Intelligent Systems

Special Issue
DEBEST 2023

www.debest.tech

The DEBEST International Conference on Digital Ecosystems, Blockchain Evolution, and Sustainable Transformation (DEBEST2023 (https://debest.tech/2023/) took place in the beautiful ecosystem of Villa La Collina at Lago di Como from 18-23 Oct 2023, Cadenabbia, opposite the historic paradise island Bellagio at the Lago di Como Lake, Italy. The modern conference facility used to be the summer residence of Chancellor Konrad Adenauer of Germany.

The DEBEST2023 has drawn on the tradition of the IEEE DEST (Digital Ecosystems, Science and Technology) conference, which was established in 2007, and sponsored by the IEEE Industrial Electronics Society which was emerged at the same time as the European Union 6th Framework Initiative in 2006 on Digital Business Ecosystems. In the last 15 years, this conference series has extended the concepts and expanded the studies across Europe, Asia Pacific and North America. It was the first technical conference on Digital Ecosystems in the world and was one of the highest-cited conferences in IEEE IES society publications. The future DEBEST conference will be continuously embraced by IEEE as a technically sponsored conference. This conference attracts a wide range of participants, including ICT leaders, network engineers, AI experts, gig workers, knowledge consultants, educators, governors, and policy makers from across the world.

In 2023, in considering the plethora of issues and challenges facing humanity and society, such as the pandemic, geo-political tensions, energy shortages, inflection, poverty, food security, etc., we moved from DEST to DEBEST, that is from digital science technology development to digital democracy evolution for sustainable transformation, a new paradigm of collective governance for the advancement of people, planet, peace and prosperity. This initiative has been supported by some of the world's leading exponents from eminent Professors to renowned industry leaders in the US, Europe, and Asia Pacific to give keynote and plenary speeches. These eminent keynote speakers include:

- **Professor Ernst Ulrich von Weizsäcker**, who is one of the 100 most influential thinkers in the world, who will led the discussion – "The Cadenabbia Agenda", and to help position our future research, development, and conferences by addressing social, economic, and environmental challenges and pathways for science and technology to meet people, planet, peace and prosperity as well as politics, and philosophies His keynote provided a quantum transformation of the future DEBEST conference series.
- **Professor Ernesto Damiani** from the University of Milano, the first recipient of EU 6th Framework project on Digital Ecosystems. He is one of the pioneers for this digital Ecosystem conference. He is also a Director of the Center for Cyber Physical Systems (C2PS) within Khalifa University, UAE. President of the Consortium of Italian Computer Science Universities. and Khalifa University and gave a keynote on "Smart and Resilient Digital Ecosystems for Sustainable Transformation".
- **Prof Martin Anda**, Murdoch University, Australia, was the Chairman of the World Renewable Energy Congress 2022 and is the Chair of Environmental Engineering at Murdoch University, Australia. He co-directed the successful Renewable Hydrogen Industry Hub in Western Australia. He provided DEBEST2023 with a the presentation on "Towards the Hydrogen Age and the Cyclic Economy"
- **Sinan Tumer** of COO Naqi Logix Inc. USA is an international thought leader and strategist on catalyzing

innovation in the world's leading companies. He served three decades at SAP Labs, working on five continents to coordinate global teams in research, development, and co-innovation partnerships. He delivered the keynote on "Catalyzing Breakthrough Innovations" to DEBEST 2023

The conference also supported by the following international renowed reseracher leaders who gave plenary speeches, and these include:

- Professor **Christian Wagner**, City University of Hong Kong,
- Professor **Katarina Stanoevska-Slabeva**, University of St. Gallen, Switzerland,
- Professor **Marc-Oliver Pahl**, IMT Atlantique and TU Munich, France, and Germany,
- Professor **Gregor C. Falk**, University of Education Freiburg, Germany,
- Dr. **Lutz Bauer**, Furtwangen University, Germany,
- Dr. **Christian Huebner**, KAS, Germany,

The conference had several peer reviewed technical tracks that included academic research papers, and industry reports. The conference proceedings consist of the peer-reviewed papers from the DEBEST2023 and are published on-line together with the video of their oral presentations. We thank all the international reviewers for their effort to select, critic and recommend the publications.

There will be Special issues for DEBEST2023 in the International Journal of Engineering Intelligent Systems, ISSN 1472 8915, Vol 32.

- The First Special Issue contains selected the technical papers.
- The Second Issue contains keynote and plenary papers.

In this special issue part 1 and 2, we present the publications that focus on the preamble, principles and future solutions, as follows:

Preamble

a. Our world is an imperfect place. People have always summoned technologies to better their lives. Our concern must be that the technologies we use live up to this responsibility to improve the well- being of all individuals.
b. We are facing major challenges and have to solve wicked problems. Therefore, problems need to be looked at from a holistic perspective.

Principles

a. Technologies should be rewarding, benevolent, convenient, fair, trustworthy, accountable, affordable, accessible, modular, distributed, adaptable.
b. Trust requires time to be developed. Individuals will only trust technology if it exhibits benevolent criteria over time.
c. The benefits of technology need to be distributed in a fair manner.
d. Digital solutions need to be developed and used according to true costs recognizing externalities.
e. Solutions have to be science-based taking total costs into account.
f. Everything is a resource.
g. We need solutions not band aids.
h. Digital solutions should be developed with a participatory approach.
i. Technology serves best when it augments the human factor. Especially in the innovation process and in educational material.
j. Technologies can divide and alienate. To minimize existing and to avoid new technology induced barriers, solutions need to be accessible, inclusive, explainable and understandable.
k. Digital technologies help to prevent exceeding of the carrying capacities of earth's systems and cycles.

Solution Approaches

a. The collaboration between humans and digital technologies will redefine boundaries of daily life and work. This requires new forms of teaching and learning to live up to the well-being of all individuals.

b. Redesign “The winner takes it all”. Ensure that this “law” of the digital platform economy is summoned by checks and balances. Account for values and principles of each individual and the societies.
c. System dynamics and 360 degree thinking need to be taught, considered, and scoped so that people understand the casualties of their actions.
d. Critical thinking with regard to system boundaries is needed.
e. Regulations are needed to make the best use of the possibilitys’ technologies offer.
f. In engineering and science as well as in daily and professional life, always put humans first. In particular, their essence of being human and their needs using human-centered design approaches.
g. To communicate and help individuals to understand the values and principles of their society we can use storytelling and games.
h. Develop communication, negotiation, and argumentation methods to effectively and continuously establish trust in the digital future.
i. Prioritize “quality innovation” with digital technologies. Innovations need to enhance individual, social, and environmental well-being for such innovations to be sustainable.

The DEBEST 2023 (Digital Ecosystems, Blockchain Evolution, and Sustainable Tranformation, www.debest.tech) was a think-tank attended by a group of world class experts in Digital Ecosystems and Sustainable Transformation from Science, Education, and Innovation Adoption.
It was led by the General Co-Chairs

- Professor **Elizabeth Chang**, IEEE Fellow, Griffith University, Gold Coast, Australia and
- Professor **Achim P. Karduck**, Faculty of Computer Science, Furtwangen University, Germany.

The conference was supported by the

- **Advisory Chair** Professor **Okyay Kaynakv** Former IEEE IES President, Editor-in-Chief IEEE TICPS
- **Honorary Chair**, Professor **Tharam Dillon**, IEEE Fellow, Editor-in-Chief International Journal EIS.

The Editors
This publication is driven by the Cadenabbia Agenda and the editors for the Special issues are:
Professor **Achim P. Karduck**, Professor **Elizabeth Chang**, Professor **Stefanie Betz**, Professor **Irma Lindt**, Professor **Andrea Back**.