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PROCEEDINGS

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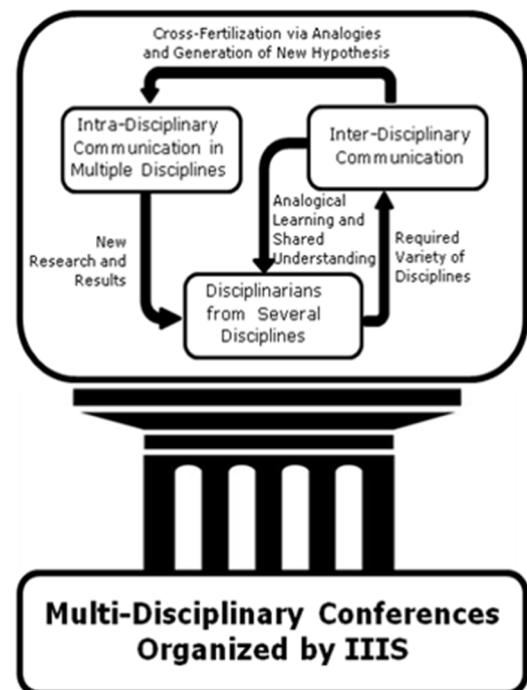
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FOREWORD

Informatics and Cybernetics (communication and control) are having an increasing impact on societies and in the globalization process that is integrating them. Societies are trying to regulate this impact and adapt it to their respective cultural infra-structures. Societies and cultures are in reciprocal co-adaptations with Information and Communication Technologies. Synergic relationships might emerge in this co-adaptation process by means of positive and negative feedback loops, as well as feedforward ones. This would make the whole larger than the sum of its parts, generating emergent properties in the parts involved as well as in the whole coming forth. The academic, private, and public sectors are integrating their activities; multi-disciplinary groups and inter-disciplinary teams are being formed, and collaborative research and development projects are being organized in order to facilitate and adequately orient the design and implementation of the feedback and the feedforward loops, and potentially generating synergic relationships. This phenomenon persuaded the Organizing Committee to organize the 16th International Multi-Conference on Society, Cybernetics and Informatics (IMSCI 2022) in a multi-disciplinary context along with other collocated events. Consequently, participants may focus on one discipline, while allowing them the possibility of attending conferences from other disciplines. This systemic approach stimulates cross-fertilization among different disciplines, inspiring scholars, originating new hypothesis, supporting production of innovations and generating analogical thinking.

IMSCI 2022 was organized and sponsored by the International Institute of Informatics and Systemics (IIS, www.iis.org), member of the International Federation of Systems Research (IFSR). The IIS is a **multi-disciplinary organization for inter-disciplinary communication and integration**, which includes about 5000 members. Consequently, a main purpose of the IIS is to foster knowledge integration processes, interdisciplinary communication, and integration of academic activities. Based on: 1) the transdisciplinarity of the systemic approach and its emphasis on *relationships* and *integrating* processes, and 2) the multi-disciplinary support of cybernetics' and informatics' concepts, notions, theories, technologies, and tools, the IIS has been organizing multi-disciplinary conferences as a platform for fostering inter-disciplinary communication and knowledge integration processes.

Multi-disciplinary conferences are organized by the IIS as support for both **intra-** and **inter-disciplinary** communication. Processes of intra-disciplinary communication are mainly achieved via traditional paper presentations in corresponding disciplines, while conversational sessions, regarding trans- and inter-disciplinary topics, are among the means used for inter-disciplinary communication. Intra- and inter-disciplinary communications might generate *co-regulative cybernetic loops*, via negative feedback, and *synergic* relationships, via positive feedback loops, in which both kinds of communications could increase their respective effectiveness. Figure (at the right side) shows at least two cybernetic loops if intra- and inter-disciplinary are adequately related. A necessary condition for the effectiveness of Inter-disciplinary communication is an adequate level of **variety** regarding the participating disciplines. *Analogical thinking and learning processes* of disciplinarians depend on it, which in turn are potential sources of the creative tension required for cross-fertilization



among disciplines and the generations of new hypothesis. An extended presentation regarding this issue can be found at <http://www.iis.org/MainPurpose/>

One of the main purposes of IMSCI 2022 is to bring together academics, professionals, and managers from the private and the public sectors, in order to share ideas, results of research, and innovative services or products, in a multi-disciplinary and multi-sector forum. Educational technologies, socioeconomic organizations, and sociopolitical processes are essential domains among those involved in the evolving co-adaptation and co-transformation between societies and cultures on the one hand, and between informatics and cybernetics (communication and control) on the other hand. Consequently, the main conference in the context of the IMSCI 2022 Multi-Conference is the 20th International Conference on Education and Information Systems, Technologies and Applications: EISTA 2022. The relationship between education/training and Information and Communication Technologies (ICT) is quickly intensifying and sometimes appears in unexpected forms and in combination with original ideas, innovative tools, methodologies, and synergies. Accordingly, the primary purpose of EISTA 2022 has been to bring together researchers and practitioners from both areas together to support the emerging bridge between education/training and the ICT communities.

In the context of EISTA 2022, practitioners and consultants were invited to present case studies and innovative solutions. Corporations were invited to present education/training information systems and software-based solutions. Teachers and professors were invited to present case studies, specifically developed information systems, and innovative ideas and designs. Educational scientists and technologists were invited to present research or position papers on the impact and the future possibilities of ICT in educational systems, training processes, and methodologies. Managers of educational organizations and training consultants were invited to present problems that might be solved with ICT or solutions that might be improved by different approaches and designs in ICT.

EISTA 2022 provides a forum for the presentation of solutions and problems in the application of ICT in the fields of education/training. Authors of the papers included in the proceedings provided diverse answers to the following questions:

- What is the impact of ICT in education and training?
- How ICTs are affecting and improving education and training? What networks and models are emerging?
- How are universities, schools, corporations and other educational/training organizations making use of ICT?
- What electronic tools are there to facilitate e-learning, distance education and co-operative training?

On behalf of the Organizing Committees, I extend our heartfelt thanks to:

1. The 96 members of the Program Committee from 31 countries (including the events and the special tracks organized in the context of IMSCI 2022);
2. The 126 additional reviewers, from 49 countries, for their *double-blind peer reviews*; and
3. The 54 reviewers, from 18 countries, for their efforts in making the *non-blind peer reviews*. (Some reviewers supported both: non-blind and double-blind reviewing for different submissions).

A total of 310 reviews made by 180 reviewers (who made at least one review), from 49 countries, contributed to the quality achieved in IMSCI 2022. This means an average of 5.96 reviews per submission (52 submissions were received). *Each registered author had access, via the conference web site, to the reviews that recommended the acceptance of their respective submissions.* Each registered author could also get information about: 1) the average of the reviewers evaluations according to 8 criteria, and the average of a global evaluation of his/her submission; and 2) the comments and the constructive feedback made by the reviewers, who recommended the acceptance of his/her submission, so the author would be able to improve the final version of the paper.

In the organizational process of IMSCI 2022, about 52 articles were submitted. These proceedings include about 22 papers, from 9 countries that were accepted for presentation (30 countries taking into account the presentations in collocated events). We extend our thanks to co-chairs special tracks organizers for their support. The submissions were reviewed as carefully as time permitted; it is expected that most of them will appear in a more polished and complete form in scientific journals.

This information about IMSCI 2022 is summarized in the following table, along with the other collocated conferences:

Conference	# of submissions received	# of reviewers that made at least one review	# of reviews made	Average of reviews per reviewer	Average of reviews per submission	# of papers included in the proceedings	% of submissions included in the proceedings
WMSCI 2022	153	364	606	1.66	3.96	81	52.94 %
IMSCI 2022	52	180	310	1.72	5.96	22	42.31 %
WMSCI/IMSCI 2022	205	544	916	1.68	4.47	103	50.24 %
CISCI 2022	80	311	598	1.92	7.48	49	61.25 %
TOTAL 2022	285	855	1514	1.77	5.31	152	53.33 %

All submissions were peer reviewed by the two-tier reviewing methodology of the International Institute of Informatics and Systemics (IIS, www.iis.org). As it might be noticed, from the table above, 5.96 reviews were made, in average, for each submission we received. After the conference is over, the names of the reviewers will be published on the IIS web site along with the titles of the papers each reviewer reviewed. This means that what had been a double-blind review, up to the conference, is transformed to single-blind review, after the conference is over. In this way, each author would have information about the names of the reviewers of his/her submission, but not vice-versa. Likewise, each author would know how many reviewers reviewed his/her submission and relate it to the average, being informed in the above table, of 5.96 reviews per paper.

Our two-tier reviewing methodology meet two different objectives of peer-review: 1) to improve the paper via non-anonymous reviewers (non-blind reviews) and 2) to improve the acceptance/non-acceptance decision of the Organizing Committee via traditional anonymous reviewers (double-blind reviews) A recommendation to accept, made by non-anonymous reviews, is a **necessary** condition, but it is not a **sufficient** one. A submission, to be accepted, should also have a majority of its double-blind reviewers recommending its acceptance. These two necessary conditions generate a **more reliable and rigorous** reviewing than any of those reviewing methods, based on just one of the indicated methods, or just on the traditional double-blind reviewing.

We extend our gratitude to the co-editors of these proceedings for the hard work, energy and eagerness they have shown in organizing their conferences and preparing their respective sessions. We express our intense gratitude to Professor William Lesso (1931-2015) for his wise, timely, adequate and valuable tutoring, as well as for his eternal energy, integrity, and continuous support and advice, as the Program Committee Chair of past conferences, and as Honorary President of WMSCI 2022, as well as for being a very caring old friend and intellectual father to many of us. We also extend our gratitude to Professor Belkis Sánchez, who brilliantly managed the organizing process.

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Plenary Keynote Speakers (ordered by their presentations succession)

Professor Shigehiro Hashimoto, Japan, President of the Society of Life Support Engineering (Japan), Professor of Kogakuin University (Former Councilor and Former Dean, Faculty of Engineering, Former Associate to the President), Doctor of Engineering and Doctor of Medicine, Research Area: Biomedical Engineering.

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Professor Ivan Semenist, Ukraine, Borys Grinchenko Kyiv University, Head of Oriental Languages and Translation Department.

Dr. Maurício Vieira Kritz, UK/Brazil, University of Manchester, Faculty of Biology, Medicine, and Health / National Laboratory for Scientific Computing, Petrópolis, Graduate Program on Modelling Knowledge Diffusion.

Dr. Teresa Langness, USA, Nonprofit Board President at Full-Circle Learning.

Dr. Russell Jay Hendel, USA, Towson University, Dept. of Mathematics, doctoral program at the Spertus Institute for a degree in Jewish studies.

Dr. James Lipuma, USA, New Jersey Institute of Technology, Director of the Collaborative for Leadership Education, and Assessment Research (CLEAR)

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Professor Shigehiro Hashimoto, Japan, Kogakuin University (Former Councilor and Former Dean, Faculty of Engineering, Former Associate to the President), Doctor of Engineering and Doctor of Medicine.

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Professor Nagib C. Callaos, Ph.D.
IMSCI 2022 General Chair
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