

Preface

The 8th edition of the International Symposium on Reliability Engineering and Risk Management (ISRERM) is held in Hannover, Germany, on 4 – 7 September 2022. ISRERM is a bi-annual international conference on topics which cross several engineering and civil disciplines, with the aim to advance the reliability engineering and risk management fields jointly with synergistic developments in applications.

ISRERM was jointly established by Professor Jie Li and Professor Yan-Gang Zhao, with support from Professor Alfredo Ang in 2008, to promote the scientific development and innovative application of reliability-based, risk-based, and other uncertainty-informed decision making theories and practices for addressing safety-related aspects in the design, operation and management of engineering systems, throughout their lifecycle.

The symposium has previously been held in Tongji University, Shanghai (2008, 2010), Kanagawa University, Yokohama, Japan (2012), National Taiwan University of Science & Technology, Taiwan (2014), Yonsei University, Seoul, South Korea (2016), National University of Singapore, Singapore (2018) and Beijing University of Technology, China (2020).

Over the years, ISRERM has attracted increasing attention and participants from the expert communities interested in the reliability and risk fields, worldwide. To accommodate this evolution, we expand the exposure of ISRERM by bringing it to Europe for the first time. To effectively do so, we co-organize ISRERM 2022 with representatives of the Asian, European and American communities involved in the reliability and risk fields. With ISRERM 2022, we are laying the first stone for the interconnection of the expert communities at the international level to explore the establishment of a global scientific Alliance for Safety and Reliability. To facilitate the building of the interconnection, the symposium integrates the support and participation of the European Safety and Reliability Association (ESRA), the ASCE Infrastructure Resilience Division (IRD), the ASME Safety Engineering & Risk Analysis Division (SERAD), the Liverpool Institute for Risk and Uncertainty, the International Joint Research Center for Engineering Reliability and Stochastic Mechanics (JCERSM), and the International Joint Research Center for Resilient Infrastructure (ICRI) of Tongji University. The keynote lectures at ISRERM reflect this exposure further, with speakers of international excellence from Asia, Europe, America and Australia.

From the technical activity point of view, the objective of ISRERM 2022 is to provide an all-around inspiring environment and a multi-disciplinary forum for the exchange of knowledge and expertise on theories and methods in the field of Reliability Engineering and Risk Management, and on their application to a wide range of industrial and civil problem areas.

Digital transformation has gathered pace in all industries and there are exciting opportunities for breaking completely new grounds in analytics by machine learning, in decision making by human-machine collaborative decision making, and in the deployment of

cyber-physical systems by IoT. ISRERM 2022 is serving as a launch pad for reliability engineering and risk management to go to the next level.

On another side, the 2020 pandemic has also brought great urgency to develop societies in a sustainable and just way. Reliability engineering and risk management have a role to play in the development agenda at large, because of the increasing importance to ensure the safe and proper functionality of technological and industrial systems, as the basis for further sustainable economic and societal development. With regards to this, the conference provides an academic and industrial platform to discuss such challenges and their solutions across various engineering disciplines, such as civil, mechanical, energy, aerospace and aeronautics, offshore and marine, and others.

The rich program of the conference offers the dedicated Alfredo Ang Lecture by Professor Yan-Gang Zhao, 6 keynote lectures, 26 sessions with 4 parallel tracks for a total of 125 papers, selected by an expert technical committee after rigorous peer-review. And for our young to-be researchers of the next generation, ISRERM features best student paper awards. The symposium will be held in a hybrid form to facilitate global participation despite COVID restrictions. We hope that the next ISRERM can be held in presence completely.

As conference Chairmen, we look forward to the stimulating presentations at ISRERM 2022 and the technical discussions which will emerge from them, and recognize that the success of a symposium like ISRERM depends on the contributions of many individuals and organizations, who believe in the substantial scientific and technical work that makes up the program and the event. For this reason, we first of all deeply thank all the authors who have contributed their work to the conference: the quality of submissions was extremely high and we feel gratified by the resulting high quality of the program. The organizing committee would also like to express the deepest appreciation to the keynote speakers, all members of the various committees, the mini-symposia organizers and the session chairs for their strong support to the conference preparation and development.

We certainly also highly appreciate the strong financial support by the European Safety and Reliability Association (ESRA).

Finally, we thank all of you participants who have come to live the conference: we sincerely hope you find the program stimulating and enjoyable!

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