European Safety and Reliability Association

Newsletter

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ESRA Officers' Induction Address

	*Michael Beer* *Chair*
	*Edoardo Patelli,* *Vice-Chair*
	*Maria Chiara Leva,* *Treasurer*
	*Myrto Konstantinidou,* *General Secretary*

We would like to welcome the ESRA community to the new cycle with the officer appointments made by the General Assembly of ESRA held during ESREL 2022 in Dublin. First of all, we thank the previous officer team for their great work leading ESRA to its present level of excellence. We thank the organizers of ESREL 2022, the Technical Committee Chairs and all researchers who contributed to the outstanding success of ESREL 2022.

On this basis, we are looking forward to expanding exciting activities with the ESRA community. We would like to use our service cycle as ESRA officers to further push developments in the field with a clear leadership image of ESRA. We are highly excited about having the chance to work with you as a uniquely strong team. We would like to encourage all ESRA members and in particular the Technical Committee (TC) Chairs to actively contribute to leading and to promoting initiatives under ESRA; think about potential initiatives that you would like to run under ESRA. We will provide guidance and support to structure and to facilitate the proposed initiatives. We are anxiously looking forward to your proposals, which you may wish to coordinate with your respective TC Chairs or send directly to us. We are also working on a scheme for financial support through the different TCs. Initiatives may include, for example:

- research projects/collaborations to develop theory & technology
- working groups to address specific challenges, emerging and multi-disciplinary topics
- industrial collaborations and demonstration or pilot cases
- working with authorities towards regulatory documents or guidelines
- webinars, workshops, symposia, sessions and other contributions to conferences
- publications as technical reports, discussion papers, books, Special Issues etc.
- outreach activities

You may use the ESRA newsletter to report on latest research findings, industrial applications, open positions and exchange activities, new research centers and collaborative opportunities, call for contributions for Special Issues or ESRA-related workshops etc. which are of interest to the ESRA community.

For Special Issues, you may consider that the following journals are connected to ESRA through membership of the Editors in Chief:

- Reliability Engineering and System Safety (published in

Association with ESRA)
- Structural Safety
- ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering, Part B: Mechanical Engineering
- Proceedings of the Institution of Mechanical Engineers, Part O: Journal of Risk and Reliability

Further, we would like to encourage international networking with our overseas ESRA members and technically related communities, in particular:
- ASCE Infrastructure Resilience Division
- ASME Safety Engineering and Risk Analysis Division
- The Asian community of the International Symposium on Reliability Engineering and Risk Management (ISRERM)

We are currently receiving a significant number of membership requests from non-European countries which will expand ESRA community. This expansion will open up new opportunities to collaborate on emerging topics, to form research consortia with a global coverage, to run mutual contributions to ESREL and the conferences of our partner communities etc. To facilitate these developments, we are working on publishing the list of membership on our website showing the member's expertise and interest.

We thank you very much for your great enthusiasm and engagement and wish you a fruitful success on all endeavours you embark on.

Michael Beer, Chair
Edoardo Patelli, Vice-Chair
Maria Chiara Leva, Treasurer
Myrto Konstantinidou, General Secretary

Feature Articles

On the representativeness of bridge collapse databases

Dirk Proske
Bern University of Applied Science School of Architecture, Wood and Civil Engineering
Burgdorf, Switzerland

Currently, various bridge collapse databases exist worldwide, some with worldwide data, others with country-specific data. Such country-specific data are available for the USA or China, for example. Also, within the framework of IABSE (International Association for Bridges and Structures), Taskgroup 5.1, a database with data of more than 800 bridge collapses was created. Such databases have been and are being used for statistical studies to identify the most common bridge collapse causes, the most robust bridge designs, and bridge construction materials. For example, the collapse data shows that the collapse frequency of reinforced concrete bridges normalized to the stock of the bridge materials are significantly lower than the collapse frequencies of steel or timber bridges. It is also evident that single-span girders collapse significantly more often than continuous girders. The comparison of calculated failure probabilities and collapse frequencies determined from such databases is currently the subject of intensive scientific discussions.

In addition to these databases, however, there are also singular large-scale events in which dozens, if not hundreds, of bridges are destroyed or damaged. This applies, for example, to the 2008 Wuhan earthquake in China with over 6000 damaged bridges, to the 2011 Tohoku earthquake in Japan with over 300 bridges destroyed mainly by the tsunami, or in the case of numerous severe floods in this way, e.g., in Germany in July 2021 with approx. 52 bridges severely damaged or destroyed, or in Afghanistan in 2012 with approx. 400 bridges destroyed. Due to the sheer number of bridges, these bridge collapses are not adequately represented in the databases mentioned. Occasionally, a few bridges are found in the databases for such events.

Furthermore, information on collapses of small bridges and bridges on secondary routes is much more difficult to obtain and thus underrepresented. This is referred to as underreporting. Examples of this are several bridge collapses in Carinthia and Tyrol, Austria, 2022. However, these collapses usually do not cause human fatalities, just like the collapses caused by floods, because the bridges are usually closed beforehand.

Presumably, therefore, the bridge databases are only representative to a limited extent. A recent Artificial Intelligence analysis of the IABSE bridge collapse database confirms this. However, the databases are still helpful. Firstly, they are representative of bridge collapses with fatalities, and secondly, many of these databases nevertheless reflect the great importance of floods and fluvial processes for bridge collapses. Fluvial processes are scouring, debris flow impacts, log jams, transportation of solids, and bank mobilization. Also, the details in the databases about the collapses allow much more precise forensic investigations than the mere numbers of collapses in such singular large-scale events.

For the future, attention must be paid to the development of hybrid databases, i.e., databases that contain both detailed information on individual collapses and information on events with a large number of bridge collapses. Damage reports are often prepared in the aftermath of such large-scale events which can be used for this purpose.

References

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Obituary

Nozer Singpurwalla

Nozer Darabsha Singpurwalla, 83, passed away on July 22, 2022 at his home in Washington D.C., surrounded by family. He was born in Hubli, India. As a young man, Nozer immigrated to the United States, where he obtained a M.S. in Engineering from Rutgers University, and a Ph.D. in Engineering from New York University under the direction of John Kao. He met Norah Jackson (who had recently immigrated from England) at a dance at Disneyland, and they married in 1969. Nozer and Norah lived most of their married life in Arlington, Virginia, where they raised their two children, Rachel and Darius.

Nozer was a faculty member at The George Washington University (GWU) in Washington, DC for over 40 years, serving as Distinguished Research Professor both in the Department of Statistics and the Department of Operations Research (later Engineering Management and Systems Engineering), respectively, and Director of GWU's Institute for Reliability and Risk Analysis; he further held a courtesy appointment with the Department of Decision Sciences at GWU. With areas of expertise in diverse fields including reliability theory, risk analysis, Bayesian statistical inference, quality control and statistical aspects of software engineering, he authored/coauthored three books, co-edited six additional references, and published over 200 manuscripts. Nozer was a prolific researcher who obtained prestigious grants and contracts with agencies, including the National Science Foundation (NSF), the National Institute for Standards and Technology (NIST), the Office of Naval Research, the Army Research Office, and the National Aeronautics and Space Administration (NASA), and held various secondary appointments and consultancies with several laboratories, institutes, and companies nationwide. While at GWU, he further served as a Visiting Professor at Carnegie Mellon University, Stanford University, the University of California at Berkeley, Florida State University, the Santa Fe Institute and the University of Oxford (UK). Nozer obtained additional prestigious appointments with other institutions internationally. During the fall of 1991, he was the first C. C. Garvin Visiting Endowed Professor in the Mathematical Sciences at the Virginia Polytechnic Institute and State University. In 1993, he was awarded a Rockefeller Foundation Grant as a Scholar in Residence at the Bellagio, Italy Center.

Nozer's extensive scholarship and research carried over into his teaching and service activities. He had an impressive track record as a PhD advisor to over 40 students where, in some instances, he oversaw multiple students to graduate in the same year. Nozer's scholarly service to the academy meanwhile included service on a broad array of editorial boards including the Journal of the American Statistical Association, International Statistical Review, Operations Research, Technometrics, and The American Statistician. He retired from The George Washington University in 2013 becoming an Emeritus Professor of Statistics, and served another eight years as faculty with the City University of Hong Kong. From 2013-2017, he held a joint appointment as Chair Professor in the Department of System Engineering and Engineering Management, and the Department of Management Sciences. He then transitioned to other faculty roles in the School of Data Science from 2017-2021; thereafter he was an Honorary Professor in the Department of Management Sciences at City University of Hong Kong.

Nozer was revered internationally for his scholarship, particularly regarding foundational aspects of reliability, risk analysis, and Bayesian Statistics. His efforts earned him various distinctions as a Fellow of the Institute of Mathematical Statistics (IMS), the American Statistical Association (ASA), and the American Association for the Advancement of Science (AAAS); and as an Elected Member of the International Statistical Institute (ISI). Along with these accolades, he received several additional honors and awards. He was recognized as the 1984 recipient of the U.S. Army's S. S. Wilks Award for Contributions to Statistical Methodologies in Army Research, Development and Testing; the first recipient of The George Washington University's Oscar and Shoshana Trachtenberg Prize for Faculty Scholarship in 1992; and the ASA/NSF/NIST Senior Research Fellow in 1993. In 2011, he was recognized with the Medal of Excellence award from his alma mater, Rutgers University.

Nozer had a way with words and always enjoyed a spirited debate. His colleagues will most remember his sense of humor and his ability to make the complex appear simple. He loved music (Indian, classical, and opera), history and politics, and world travel with his family. He is survived by his wife, Norah (née Jackson); his sister, Khorshed Tantra, and her family; his children,