



European Safety and Reliability Association

Newsletter

<http://www.esrahomepage.eu>

June 2019

Editorial



*Marko Čepin
University of Ljubljana,
Faculty of Electrical Engineering
Slovenia*

Dear ESRA Colleagues!

The main objectives of ESRA include the following, to promote and encourage good practices in the application of safety and reliability techniques and risk management.

The reliability was treated as an important issue well ago, although it is relatively younger than some other technical fields.

One of important engineers, who knew very much about the importance of reliability, was an aerospace engineer who worked on safety-critical systems. He was involved in tests to determine how much acceleration in terms of factors of the force of gravity a human could withstand. The research behind was a support for future airplane designs.

He attended one of the tests, where the sensors measured the acceleration force due to gravity applied when the rocket sled came to a sudden stop. Every sensor in a set of sensors could be connected in one of two ways and every one was installed incorrectly. The mistakes have been discovered by him 70 years ago in the year 1949.

The name of the engineer, who was also the Captain, was Murphy and after the mistakes, he discovered the famous sentence was born: "If there are two ways to do

something, and one of those ways will result in disaster, he'll do it that way". Or, generalized as you know it as the Murphy law: "If something can go wrong it will".

A significant progress was accomplished in the following 70 years either related to the reliability of sensors or related to reliability of other equipment or processes. Consideration of the worst case scenarios was a direct implementation of the indicated law in many industries, especially in the safety related industries.

The activities of ESRA in the last decades contributed to this progress. The probabilities of failures went down in the modern world, but the complexity of the systems and processes is increasing. This increase of complexity gives more work for risk management so our goals are far from being accomplished.

The last achievements in safety and reliability will be discussed in Hannover this September, when the ESREL 2019 European Safety and Reliability International Conference will take place. We hope that many safety and reliability experts will exchange the knowledge and experience in all fields related to the safety and reliability. We encourage that people interested in the work of specific technical committees find a way to exchange the ideas and information.

The management of the technical committees of ESRA has recently encountered a slight change. The leader of the Land Transportation Technical Committee Bob Huisman has requested to step down and Pierre Dersin will together with the Olga Fink lead the committee.

We are open to the new ideas and if there is some interesting initiative, please do not hesitate to contact and of the board members of the society.

Chairman of ESRA
Marko Čepin

Feature Articles

Public Health services in mainland Portugal: an overview



*Lúcio Meneses-de-Almeida
Department of Public Health
of the RHA of Central
Portugal (Coimbra)*

Introduction

Public Health is related to organized efforts, engaged by the whole of society, aiming to prevent and control unacceptable health situations (i.e., amenable to proper living conditions or health technologies/treatments). In a sentence, “making the acceptable unacceptable”¹.

But Public Health (PH) is also related to health systems and health services. The mission of public health services is to protect and promote the health of populations (“health of the public”).

By the mid-19th century, Portugal established a network of public health authorities, at a municipality level, in accordance with the European Sanitary Movement. GPs all over industrialized Europe realized that health outcomes were strongly associated with living and working conditions: the “thickness of the wallet” arises as a major determinant of health.

During almost 160 years, Portuguese public health services have faced demographic and epidemiological challenges, within an organizational framework municipality-based. During the early 21st century, Portuguese National Health Service (NHS) and, specifically, primary care, experienced the most important reform since its foundation, in 1979: the establishment of clusters of primary healthcare centres (“agrupamentos de centros de saúde”) and of their “functional units” (specific care provision units).

New epidemiological/public health tools have been implemented during the present decade of 2010s, namely the electronic system for reporting mandatory diseases (Portuguese acronym: SINAVE) and the electronic death certification platform (Portuguese acronym: SICO).

For the exception of the autonomous insular regions of Azores and Madeira, with their own regional governments and health systems, Portugal is divided into “health regions”. Each of these mainland Portugal’s health regions seats its own regional health administration (RHA), an “executive branch” of the Ministry of Health (MoH).

RHA’s mission is to comply and to enforce, at a regional level, national health policies and to ensure the access, by the regional population, to the “provision” of healthcare, regardless of its type/level.

Local public health services belong to the primary level of care/network.

Portuguese NHS, founded by a bill of Parliament of September 1979, comprises 3 levels of care: primary care; hospital care; and long term care. The latter, the most recent one (since 2006), is a partnership between the MoH/NHS and the Ministry of Social Affairs/Social Security, that aims to provide long term quality care effectively, efficiently and with fewer healthcare associated risks (eg. nosocomial infections). By shifting non acute patients from acute/hospital settings to community based specialized care units, long term level of care contributes to the reduction of hospital burden (due to chronic diseases/demographic ageing) and, by consequence, to the enhancement of systemic efficiency and effectiveness.

Portuguese Public Health network

Mainland Portugal’s public health “operative” services are organized into 2 geo-demographic levels: regional and local. The former corresponds to the departments of public health (DPH) of the 5 regional health administrations (RHA); and the latter to the so called “public health units”. The nationwide public health department is the Directorate-general of Health (Portuguese acronym: DGS).

Public health departments are headed by health authorities. As public health medicine’s residency (4 years) includes training on health authority issues (public health enforcement’s regulations), along with the other core competencies of an European public health physician, Portugal’s health authorities are almost exclusively public health physicians, certified by the Board of Public Health of the Portuguese Medical Association (“Ordem dos Médicos”).

Concerning the term “health authorities”, Portuguese legal lexicon refers to public health authorities. Differently, and in accordance to the EU lexicon, the RHA is the regional “health authority” (an administrative authority, politically appointed/nominated).

Portugal’s health authorities are physicians legally empowered to act, whenever needed and by all means necessary, on behalf of the Portuguese State, for the sake of the protection (“safeguard”) of the health of the population. So, Portuguese health authorities are medical officers and, consequently, the regional health authority is held by the regional medical officer.

Until 2009, the provision of primary care was based at a municipality level, and each primary care centre included several services: GP/family medicine; public health (PH)/health authority; and social service. Since then, primary care is organized into primary health care clusters.

Each primary care cluster (PCC) is held responsible for the provision of primary care - including population based care - to the respective cluster of municipalities. It comprises several specific care provision units: personalized care & family care (GP units), community care units and a sole public health unit (PHU).

It also includes a single unit per PCC providing specific human resources, such as nutritionists and

psychologists, to the other units (“shared resources” unit).

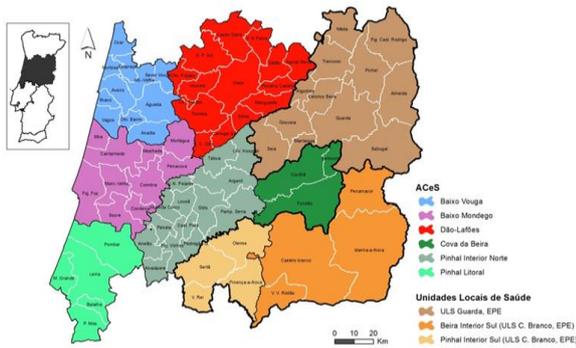


Figure 1. Central Portugal’s primary care network (NHS) ACeS: primary care clusters; ULS: local health clusters (Courtesy: Administração Regional de Saúde do Centro IP/Observatório Regional de Saúde)

Although operating at a multi-municipality level, the PHU, which is headed by a coordinating local health authority (“delegado de saúde coordenador”), comprises municipality based teams. Those public health teams, seated at the health care centre, are led by a local health authority (“delegado de saúde” – literally meaning deputy for health) and include one or more environmental health technicians and, in some cases, a public health/community health nurse. There are several reasons why public health units are short of full time nurses: public health nursing practice is less attractive than clinical primary care nursing practice and, on the other hand, health managers prioritize acute/curative care instead of public health/preventive care.

The departments of public health of the RHAs (DPH) act as regional public health services (population based health protection and promotion). Similar to the PHU, they perform the essential operations of a WHO Euro’s public health service (EPHOs).

Public health operations of the DPH are, naturally, adjusted to its regional level of intervention and include “top-down” support and supervision of local public health services (PHU)/local health authorities and “bottom-up” reporting to the Directorate-general of Health.

Health observation is one of the core functions of the DPH. Regional health observatories, seated at the correspondent DPH, ensure the generation of regional and local health profiles, by working within a collaborative partnership.

Data is collected, from various primary sources (for instance, the National Institute of Statistics, the National Health Survey and the Directorate-general of Health) and collated by the whole network, and put at the disposal of the individual health observatories, for further and specific treatment.

Health profiles portrait a population like one describes the two faces of a coin: one face (“heads”) corresponds to the health outcomes, measured by health indicators (morbidity and mortality); the other (“tails”) to the epidemiological exposures that determine the outcomes: demography (sex & age structure);

socioeconomics (“wealth is health”); lifestyles; and health services’ access and provision of care.

At a regional level, there are two regional health authorities: the “Chief” Regional Health Authority/Regional Medical Officer (“delegado de saúde regional”) and a deputy/vice (“delegado de saúde regional adjunto”). The former acts as the Head of the DPH.

Table 1. Relationship between Portuguese public health departments and Health Authorities/heads

Public health department	Geo-demographic level	Head
Directorate-general of Health	National	National Health Authority (Director-general of Health)
Department of Public Health of the RHA	Regional	“Chief” Regional Health Authority
Public Health Unit of the PCC	Local/multi-municipality	Coordinating Local Health Authority

The territorial area of the DPH is the same of the corresponding RHA, due to the fact that the DPH acts, as stated before, as the regional public health service (Table 1).

Finally, the National (Public) Health Authority is held by the Director-general of Health, a physician, although not necessarily a PH physician. As national health authority, the Director-general of Health is the Head of the central department of Public Health (Directorate-general of Health of the MoH – Portuguese acronym: DGS), reporting to the Government’s Health Cabinet.

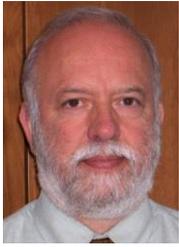
Endnote

This article was written on the visit of Prof Rostislav Kostadinov MD PhD, Vice Dean for International Relations and Project Activities and Associate Professor of Disaster Medicine (Medical University of Plovdiv – Bulgaria), to the Department of Public Health of the Regional Health Administration of Central Portugal (Coimbra, Portugal, 17-18 June 2019).

It is based on the presentation “Regional Health Administration of Central Portugal: public health services’ network - an overview”.

References

1. Galea S. Making the acceptable unacceptable. BU School of Public Health. Weblog. Available from: <https://www.bu.edu/sph/2015/06/14/making-the-acceptable-unacceptable/> [Accessed 19th June 2019].



*Carlos Guedes Soares
Editor-in-Chief RESS
Instituto Superior Técnico,
Universidade de Lisboa*

Impact of Prognostics and Health Management in Systems Reliability and Maintenance Planning

The special issue on “Impact of Prognostics and Health Management in Systems Reliability and Maintenance Planning” has been published in April 2019. This special issue was guest edited by Joo-Ho Choi, from Korea and Ming J. Zuo from Canada, to whom go our thanks for the excellent work performed. The issue has covered diverse topics related with the general area and I hope this can boost the representation of these topics in the journal.

The issue contains 23 papers with 11 from the first biannual Asia Pacific conference of the PHM society (PHMAP 2017, Jeju Island, Korea, July 2017), and 12 from open submissions. This reflects the policy that has been in force for some years now, that the Journal is not publishing special issues associated with one specific conference but instead with specific topics. This is a way of continuing providing a way for the good papers of some conferences to be channeled to the Journal, keeping however the issue open to any submission that do not come from the Conference. This is a much better system because the important issue for the journal is the promotion of specific topics on special interest, which in this way is achieved.

The papers have been grouped in five categories: 1) fault detection and diagnostics, 2) remaining useful life (RUL) prediction and prognostics, 3) PHM systems design, assessment and validation, 4) predictive maintenance planning and 5) PHM applications for reliability and safety in various industries.

Health monitoring is becoming increasingly important and there are journals devoted to the subject and to the various signal processing tools that are useful for that purpose. RESS does not want to compete with those journals and thus is not seeking papers on the techniques of health monitoring, but is interested in how the availability of that data will affect maintenance and systems reliability assessments, which hopefully this special issue has contributed to.

Risk Assessment of hydropower in Switzerland: Uncertainty quantification in the modelling of dam-break consequences

*Anna Kalinina
Advisors:
Dr. Christopher T.
Robinson, Department
Aquatic Ecology,
EAWAG, Dübendorf,
Switzerland*



*Dr. Peter Burgherr,
Laboratory for Energy
Systems Analysis, Paul
Scherrer Institut, Villigen,
Switzerland
Dr. Matteo Spada
Laboratory for Energy
Systems Analysis, Paul
Scherrer Institut, Villigen,
Switzerland*

Dams are key elements of industrial and economic development in many countries. Despite being beneficial to society, they also pose a potential danger, for example, due to uncontrolled release of a large amount of water after a dam failure. Therefore, modelling the potential risks and consequences of such events is of interest for different stakeholders.

Up to now, dam risk assessment has been reluctant to incorporate novel modelling techniques, whose application can help better understand the potential risks and further facilitate analysis and modelling of the dam-break consequences. However, this is essential for continuous improvement of decision-making processes in dam risk management. Therefore, this thesis provides valuable contributions to make a step forward in this direction.

One way to provide a sufficient dam safety level is by analyzing historical dam accidents to identify generic patterns in accident frequency, severity and societal risk. This thesis advanced the current state-of-the-art in the probabilistic analysis of dam accidents by applying a Bayesian hierarchical model to a comprehensive, global data set. The accidents were extracted from PSI's Energy-related Severe Accident Database (ENSAD), covering the period 1798-2017. First, probabilities for both frequency and severity were calculated separately, and afterwards combined to assess the specific risk for different dam types, dam purposes, dam heights, stages of the dam life cycle, and accident causes in OECD and non-OECD w/o China countries [1]. The comparison of the risks for individual dam characteristics provided numerous

additional insights previously not considered. Moreover, the developed model included an explicit modelling of a time trend parameter, which allowed detecting decreasing accident frequencies over the analyzed period. This suggest that technological development and enhanced risk management contribute to improved dam safety [2].

To complement the historical approach, this thesis introduced a novel framework for the uncertainty quantification (UQ) in the modelling of dam-break consequences with a specific focus on Swiss conditions. A Polynomial chaos expansion (PCE) was applied to quantify uncertainties in the consequences of instantaneous dam-break floods, which are normally difficult to assess with standard techniques, such as Monte Carlo simulation, because of the lack of available historical observations and high computational costs of the dynamic spatial models. PCE was used as a metamodeling tool to quantify uncertainty in the output of the dam-break flood model and the dam-break life-loss model. PCE was able to approximate each of the models using only a limited number of runs, and then propagate uncertainty in the model inputs through the metamodel to quantify the uncertainty in the model output (Figure 1) [3].

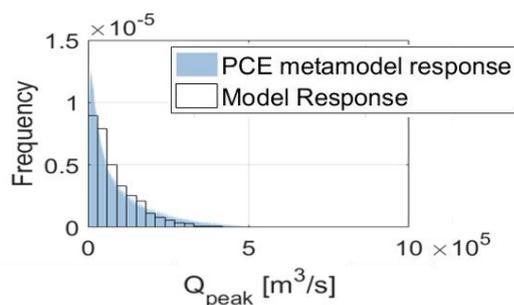


Figure 1. Model response and PCE response for the peak outflow of the dam-break flood wave, Q_{peak} [m³/s]

Furthermore, global sensitivity analysis (GSA) was performed by calculating Sobol' and Boronovo indices on the coefficients of the established PCE-metamodel. The results of the GSA revealed important model parameters that contribute most to the variability of the model estimates [4].

The proposed framework for UQ and GSA in the modelling of dam-break consequences allows to reduce computational costs compared to standard Monte-Carlo simulation-based methods. Furthermore, the proposed methodology, when applied to similar studies in dam risk assessment, enables a more generalized risk quantification than conventional approaches.

Finally, since the metamodels developed in this thesis are generic for the population of large (> 100 m) Swiss arch hydropower dams, the results of the UQ and the GSA can be used as a starting point for risk management purposes of any dam in the considered dam population.

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1. Kalinina, A., Spada, M., and Burgherr, P. Application of a Bayesian hierarchical modeling for risk assessment of accidents at hydropower

dams. Safety Science 2018, 110, 164-177. doi: 10.1016/j.ssci.2018.08.006

2. Kalinina, A., Spada, M., and Burgherr, P. Probabilistic analysis of dam accidents worldwide: Risk assessment for dams of different purposes in OECD and non-OECD countries with focus on time trend analysis. Risk Anal. (submitted).
3. Kalinina, A., Vetsch, D. F., Marelli, S., Whealton, C., Spada, M., Burgherr, P., and Sudret, B. Metamodeling for uncertainty quantification of a flood wave model for concrete dam breaks. mdpi Energies (submitted).
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Reliability Modelling and Optimization of Cloud-RAID Storage Systems with Imperfect Fault Coverage



Lavanya Mandava
Supervisor:
Professor Liudong Xing
University of Massachusetts,
Dartmouth, USA

Recent advances in cyber-physical systems, big data, and the Internet of Things have generated great demands on data storage, which engenders high needs of using cloud storage services as backbone of those technologies. Cloud storage is a model of computer data storage with data being stored in a logical space while the physical storage may span several servers managed by different cloud service providers. Because users expect to access their data anytime and anywhere from the cloud storage system, any service failure or interruption may bring negative impacts on the business and reputation of the cloud service provider. Thus, it is important to design high data reliability into the cloud storage system.

Based on diverse redundancy techniques, cloud-RAIDs (Redundant Array of Independent Disks) provide one fault-tolerant solution to achieve high data reliability. For example, the cloud-RAID 5 uses the distributed single parity code to tolerate any single disk failure that can be detected and located successfully (Figure 1).

Data are divided into non-overlapped blocks, which are striped across different disks in the array. The parity stripes are also distributed across those disks in the array. Performance and operation of physical disk drives in a cloud-RAID storage system are managed by and dependent on a controller. In addition, each disk may exhibit multiple performance levels varying from perfect function to complete failure. The inter-component dependent behavior and the multistate

behavior pose challenges to the reliability analysis of cloud-RAID storage systems.

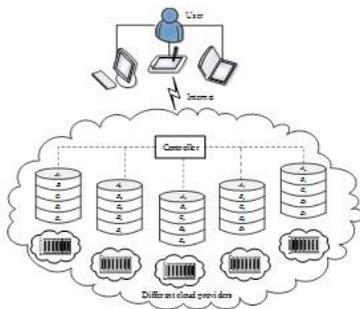


Figure 1. Example Cloud-RAID 5 Storage System

Further complicating the cloud-RAID reliability analysis is the imperfect fault coverage (IFC) behavior, where due to an imperfect system recovery or reconfiguration mechanism, a disk fault may not be timely or adequately detected, located and contained after it occurs. As a result, this undetected or uncovered fault may propagate to other components within the system, causing extensive damages and even bringing down the entire system. Failure to address the IFC behavior leads to inaccurate, often overestimated system reliability results, misleading system design, operation and optimization activities.

Existing works on the cloud-RAID system reliability have typically assumed fully reliable fault detection and recovery mechanisms (i.e., perfect fault coverage), which is rarely true in real-world systems. This dissertation research relaxes this assumption through decision diagrams-based combinatorial approaches for reliability modeling and analysis of the cloud-RAID storage system subject to the IFC. The proposed methods are applicable to homogenous or heterogeneous disks with arbitrary types of time-to-failure distributions. Two different IFC models are considered: element level coverage (ELC) where effectiveness of the system recovery mechanism and thus the fault coverage probability rely on the occurrence of each individual disk fault, and fault level coverage (FLC) where the coverage probability relies on the number of disk faults happening to a particular group within a certain recovery window. Both binary-state and multi-state disk and system models are addressed.

Cloud-RAID 5 (using the single parity code) and cloud-RAID 6 (using the double parity code) systems are analyzed as case studies to illustrate effects of function dependence, multistate and imperfect coverage factors.

This dissertation research also considers the cloud provider selection problem under both ELC and FLC, which finds the combination of cloud disk providers maximizing the system reliability or minimizing the system cost. Both unconstrained and constrained optimization problems are formulated and solved.

Four case studies of different sizes are performed to illustrate the proposed optimization problems and solution methods. It is also demonstrated that solutions to the proposed optimization problems can facilitate optimal decisions on choices of disk drives balancing the overall system reliability and cost.

ESRA News

ESRA TC on Maintenance Modelling and Applications – Industrial Panel Session at ESREL 2018 Trondheim, Norway



Mitra Fouladirad
Troyes University of Technology,
France



Anne Barros,
Norwegian University of Science and
Technology, Trondheim, Norway



Christophe Bérenguer
Grenoble Institute of Technology,
France

Panelists

- Kim Alexander Jørgensen – Lundin
- Erling Lunde – Equinor ASA
- Frank Børre Pedersen – DNV-GL
- Christophe Bérenguer and Mitra Fouladirad – ESRA TC Maintenance Modelling and Applications
- Jørn Vatn and Anne Barros – RAMS Group NTNU

The ESRA TC on Maintenance Modelling and Applications organizes every year a gathering at ESREL conference.

For the ESREL 2018 edition, the TC maintenance annual meeting took place at Trondheim on June 20th, and consisted in an industrial panel session. The session was co-organised by the RAMS group of NTNU (Norwegian University of Science and Technology) in presence three Norwegian industrial partners concerned with maintenance problems: DNV GL, Equinor ASA and Lundin. People from the local industrial network joined to present their current main concerns in maintenance optimization and to confront them with the academia community. The presentation of the new current challenges in maintenance by the industrial partners was followed by a very lively debate on the topic.

Some of the maintenance issues highlighted by the industrials are listed as follows:

- 1) Inspection policy optimisation based on efficient data analyses.
- 2) Remote inspection policy optimisation with joint cost, performance and risk perspective.

- 3) Prognostic precision improvement considering physical models and available data.
- 4) Useful prognostic by finding a balance between the data quality, the performance of data analysis methods and the prediction expectations.
- 5) Digitalization of the maintenance cycle.

In brief, the following challenges were pointed out:

- 1) Prognostic: Remaining Useful Life definition and RUL probability calculation based on physical models, probabilistic modelling, statistical tools and machine learning performances.
- 2) How to overcome the data treatment difficulties dealing with data with different quality and quantity?
- 3) How to create a better communication between data feeders and data analysts to fill the gap between what is available and what is needed.
- 4) Provide efficient tools to carry out real time data analyses and prognostics.

The ESRA TC on maintenance thanks the NTNU RAMS group for helping to organize this very interesting panel session. The public showed its interest by asking lot of questions and highlighting existing gaps between the academical research on maintenance and the real maintenance operations and current issues that industry is facing. Much work ahead in maintenance modelling and applications to tackle all these exciting challenges! Persons who are interested to discuss, exchange or deal with maintenance problems and the listed challenges are welcome to contact and to join the ESRA TC on Maintenance

Contacts: ESRA Maintenance Modelling and Applications TC Chairs:

christophe.berenguer@grenoble-inp.fr
mitra.fouladirad@utt.fr



Calendar of Reliability and Safety Events

38th International Conference on Ocean, Offshore and Arctic Engineering (OMAE2019) Symposium on Structures, Safety and Reliability Glasgow, Scotland 9-14 June 2019

OMAE 2019 is the ideal forum for researchers, engineers, managers, technicians and students from the scientific and industrial communities from around the

world to meet and present advances in technology and its scientific support, exchange ideas and experiences while promoting technological progress and its application in industry, and promote international cooperation in ocean, offshore and arctic engineering.

Following the tradition of excellence of previous OMAE conferences, more than 900 technical papers are planned for presentation. The OMAE Congress is organised in about 12 Symposia each dealing with specific topics. The Structures, Safety and Reliability Symposium, as the name suggests, deals with offshore structures safety and reliability, having typically between 100-150 papers. Typical sessions include Probabilistic and Spectral Wave Models, Probabilistic Response Modelling, Reliability of Marine Structures, Fatigue Reliability, Reliability of Mooring and Risers, Reliability Renewable Energy Devices, Risk based Maintenance planning and Risk Analysis & Safety Management.

Conference Chairs:

Professor Atilla Incecik University of Strathclyde, UK
Technical Program Chair

Professor Krish Thiagarajan Sharman , University of Massachusetts Amherst (USA)

Safety and Reliability Symposium Coordinator

Professor Carlos Guedes Soares

Contacts:

Specific questions can be addressed to the **Safety and Reliability Symposium Coordinator** at:

c.guedes.soares@centec.tecnico.ulisboa.pt

Conference Website: <https://event.asme.org/OMAE>

The International Conference on Information and Digital Technologies 2019 (IDT 2019) 25 – 27 June 2019 Zilina, Slovakia

The International Conference IDT'2019 is the annual event. The aim of the Conference is to bring together researches, developers, teachers from academy as well as industry working in all areas of digital technologies. Especially young researchers and postgraduate PhD students are greatly welcome to participate in this event. Beside the scientific field, several cultural and social events are planned for the enjoyment of the Conference attendees. Each paper will be evaluated for acceptance by at least two peer reviewers. Furthermore, paid registration to the Conference is mandatory for paper acceptance (one registration per paper). The conference proceeding will be indexed in IEEEExplore, Scopus and Web of Science.

The conference is organized in cooperation with European Safety and Reliability Association and the IEEE Czechoslovakia Section Reliability Society Chapter.

Special events

- Int. Workshop on Reliability and Safety Technologies

- Int. Workshop on Biomedical Technologies
- Int. Workshop on New Frontier Information Digital Technology
- Int. Workshop on Computer-aided Modeling: Theory and Applications Topics

Topics

The conference makes is focused on a wide range of applications of computer systems according topics of special events.

Keynote Presentation

- *Reliability of Smart Grids*, Marko Čepin, University of Ljubljana, Slovenia
- *Digital re-engineering for safety management*, Coen van Gulijk, University of Huddersfield, United Kingdom
- *Opportunities and Challenges of the Reliability of AI Systems*, Min Xie, City University of Hong Kong, Hong Kong

Important dates:

Final program: 10th June, 2019

Conference website: <http://idt.conf.sk>

17th International Probabilistic Workshop

11 - 13 September 2019

Edinburgh, United Kingdom

The conference is intended for mechanical, civil and structural engineers and other professionals concerned with components, structures, systems or facilities that require the assessment of safety, risk and reliability. Participants could therefore be consultants, contractors, suppliers, owners, operators, insurance experts, authorities and those involved in research and teaching.

Key topics:

Safety, Risk, Probabilistic Modelling and Computation, Reliability, Structural Safety, Risk Analysis, Natural Hazards, Uncertainties.

Organisation:

Chair: Assoc. Prof. Dr. Daniil Yurchenko

IMPEE, Heriot-Watt University, Edinburgh, United Kingdom

Organizing Committee

- Prof. D. Val.

EGIS, Heriot-Watt University, Edinburgh, United Kingdom

- Prof. V. Demyanov.

EGIS, Heriot-Watt University, Edinburgh, United Kingdom

- Prof. D. Flynn.

ISSS, Heriot-Watt University, Edinburgh, United Kingdom

- Dr. Gordon Thomson.

IMPEE, Heriot-Watt University, Edinburgh, United Kingdom

- Dr.-Ing. Dirk Proske

University of Natural Resources & Applied Life Sciences, Vienna, Austria

Bern University of Applied Sciences, Burgdorf, Switzerland

Conference Secretary

Dr. Gordon Thomson

IMPEE, Heriot-Watt University, Edinburgh, United Kingdom

E-mail: grt2@hw.ac.uk

Conference Language: English

Deadlines:

Deadline for presenting author registration: 21st June 2019

Further information:

Dr. Daniil Yurchenko, DSc, PhD,

Reader, Associate Professor,

Institute of Mechanical, Process and Energy Engineering,

School of Engineering and Physical Sciences,

Room 1.23 James Nasmyth Building, Gate 3,

Heriot-Watt University,

EH14 4AS, Edinburgh, UK

Tel: +44 (0) 131 451 8097

Email: d.yurchenko@hw.ac.uk

Save the Date for ESREL 2019 – 29th European Safety and Reliability Conference

22 - 26 September 2019

Leibniz Universität Hannover, Hannover, Germany

The annual European Safety and Reliability Conference (ESREL) is an international conference under the auspices of the European Safety and Reliability Association (ESRA). The 29th edition of the conference will be held on 22 - 26 September 2019 at the iconic Welfenschloss, the heart of the Leibniz Universität Hannover. The objective of ESREL 2019 is to provide an all-round inspiring environment and a multi-disciplinary forum for the exchange of knowledge and expertise on theories and methods in the field of risk, safety and reliability, and on their application to a wide range of industrial, civil and social sectors and problem areas. The interplay among technological, societal and financial aspects is attentively considered in addressing the demands and challenges that evolve from today's rapidly changing world and its digitalization. While the occurring changes enable innovative developments, such as smart cities and systems or autonomous transportation, they also introduce newly arising, yet potentially unknown, hazards and risks, e.g. related to and challenging cybersecurity, data security, big data, complexity and interdependencies of systems, cascading failures across

systems and sectors, resilience of infrastructures, and more. Clearly, there is a strong need for evolution and advancement of the field of reliability, risk and safety to cope with these challenges for arriving at taking the right decisions in the design and operation of technological and industrial systems. We, the organizers, are very much looking forward to a vivid exchange of ideas and visions in this context, with a broad thematic coverage. Papers presented at ESREL 2019 will be published in open access conference proceedings by Research Publishing Services, Singapore, and be indexed.

Organisers:

Conference General Chair:

Prof. Michael Beer - Leibniz Universität Hannover, Germany.

Conference General Co-Chair:

Prof. Enrico Zio - Politecnico di Milano, Italy

Conference Website: <https://esrel2019.org/#/>

7th International Conference on Risk Analysis and Crisis Response (RACR, 2019)

15-19 October 2019

Athens, Greece

We are pleased to announce and invite you to participate in the 7th International Conference on Risk Analysis and Crisis Response (RACR 2019).

RACR, launched by the Risk Analysis Council of China Association for Disaster Prevention in 2007 and taken over by SRA-China since 2011, is a series of biennial international conferences on risk analysis, crisis response, and disaster prevention for specialists and stakeholders.

In the Internet age, more and more data can support a large number of models for risk analysis. The simple, transparent, and reliable risk models are being favored by researchers. The assessment of integrated risks in complex systems is towards practical use. Risk analysis based on data is winning subjective judgment. Meanwhile, the world is increasingly turbulent. The black-swan events occur more frequently, and a crisis of undercoordination, such as the debt crisis of 2008, might suddenly erupt. Crisis response beyond knowledge is increasingly testing people's intelligence. RACR provides a unique international forum to discuss these issues from a scientific and technical point of view and also in terms of management, services or usages. RACR provides a unique international forum to discuss these issues from a scientific and technical point of view and also in terms of management, services or usages.

Theme: Risk Analysis Based on Data and Crisis Response Beyond Knowledge

Conference Topics

1. Applying Risk Science based on data
2. Stakeholder engagement to manage risks

3. Risk analysis related to black-swan events
4. Responding to a crisis of undercoordination
5. Reliability and safety in industrial systems
6. Modern trends in crisis management
7. Internet of Intelligences and risk radar
8. Nanotechnology safety
9. Safety in transport domain
10. Progress in occupational health and safety
11. Natural Hazards inducing tech. accidents (NATECHs)
12. Human Factors in the industrial environment
13. Life-cycle analysis of units
14. Legal aspects in Major Accidents Prevention
15. Disaster risks in line with "Belt and Road"
16. Risk analysis in project investment and finance
17. Risk analysis related to black-swan events
18. Terrorist attack and crisis response

Conference Venue: National Center for Scientific Research "Demokritos"

Contact Information: racr2019@ipta.demokritos.gr

Conference Website:

<https://mssg.ipta.demokritos.gr/racr2019/#>

5th Nordic Chapter of the Society for Risk Analysis (SRA Nordic) Conference - Risk Management for Innovation

6-8 November 2019

Copenhagen, Denmark

The Nordic Chapter of the Society for Risk Analysis (SRA Nordic) invites you to its fifth conference that will be held in Copenhagen.

The objective of the SRA Nordic 2019 conference is to provide a multi-disciplinary forum for the exchange of knowledge and expertise on theories, methods and practices in the field of risk management within the Nordic and Baltic countries (Denmark (incl. Greenland), Faroe Islands, Finland, Norway, Sweden, Iceland, Latvia, Lithuania, and Estonia).

The conference will bring together the Nordic and Baltic research community on Risk Analysis of innovative products and technologies. The target audience are academics and practitioners interested in the assessment, characterization, communication, management and policy of the risks connected to innovation, such as risk to human health, the environment and other.

The conference will be the breeding ground for student participants.

Events such as a poster session and career development opportunities will enable student participants to build a strong network within the community.

Contribution types: Abstract and Posters. Abstracts for oral and poster presentations as well as workshops must be prepared by using the provided templates.

Call for abstracts

SRA Nordic invites abstract submissions for oral and poster presentations. We also invite submissions for workshop proposals.

Important Deadlines:

Deadline for submissions: 15th August 2019

Deadline for registration: 15th October 2019

Contact Information: RA_Nordic_2019@man.dtu.dk

Conference Venue: IDA Conference Centre, Kalvebod Brygge 31-33 1780 Copenhagen V.

Conference Website: www.risklab.dtu.dk/sra-nordic-2019/

ESRA Information

1. ESRA Membership

1.1 National Chapters

- French Chapter
- German Chapter
- Italian Chapter
- Polish Chapter
- Portuguese Chapter
- Spanish Chapter
- UK Chapter

1.2 Professional Associations

- The Safety and Reliability Society, UK
- Danish Society of Risk Assessment, Denmark
- SRE Scandinavia Reliability Engineers, Denmark
- ESReDA, France
- French Institute for Mastering Risk (IMdR-SdF), France
- VDI-Verein Deutscher Ingenieure (ESRA Germany), Germany
- The Netherlands Society for Risk Analysis and Reliability (NVRB), The Netherlands
- Polish Safety & Reliability Association, Poland
- Asociación Española para la Calidad, Spain

1.3 Companies

- TAMROCK Voest Alpine, Austria
- IDA Kobenhavn, Denmark
- VTT Industrial Systems, Finland
- Bureau Veritas, France
- INRS, France
- Total, France
- Commissariat à l'Energie Atomique, France
- DNV, France
- Eurocopter Deutschland GmbH, Germany
- GRS, Germany
- SICURO, Greece
- VEIKI Inst. Electric Power Res. Co., Hungary
- Autostrade, S.p.A, Italy
- D'Appolonia, S.p.A, Italy
- IB Informatica, Italy
- RINA, Italy
- TECSA, SpA, Italy
- TNO Defence Research, The Netherlands
- Dovre Safetec Nordic AS, Norway
- PRIO, Norway
- SINTEF Industrial Management, Norway

- Central Mining Institute, Poland
- Adubos de Portugal, Portugal
- Transgás - Sociedade Portuguesa de Gás Natural, Portugal
- Cia. Portuguesa de Produção Electrica, Portugal
- Siemens SA Power, Portugal
- ESM Res. Inst. Safety & Human Factors, Spain
- IDEKO Technology Centre, Spain
- TECNUN, Spain
- TEKNIKER, Spain
- CSIC, Spain
- HSE - Health & Safety Executive, UK
- Atkins Rails, UK
- W.S. Atkins, UK
- Railway Safety, UK
- Vega Systems, UK

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- University of Innsbruck, Austria
- University of Natural Resources & Applied Life Sciences, Austria
- AIT Austrian Institute of Techn. GmbH, Austria
- Université Libre de Bruxelles, Belgium
- University of Mining and Geology, Bulgaria
- Czech Technical Univ. in Prague, Czech Republic
- Technical University of Ostrava, Czech Republic
- University of Defence, Czech Republic
- Tallin Technical University, Estonia
- Helsinki University of Technology, Finland
- École de Mines de Nantes, France
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- Universidade de Coimbra, Portugal
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- Slovak Academy of Sciences, Slovakia
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- University of Ljubljana, Slovenia
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- PMM Institute for Learning, Spain
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1.5 Associate Members

- Federal University of Pernambuco, Brazil
- Fluminense Federal University, Brazil
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- European Commission - DR TREN (Transport and Energy), in Luxembourg
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3. Standing Committees

3.1 Conference Standing Committee

Chairman: A. Grall, University of Tech. of Troyes, France
The aim of this committee is to establish the general policy and format for the ESREL Conferences, building on the experience of past conferences, and to support the preparation of ongoing conferences. The members are one leading organiser in each of the ESREL Conferences.

3.2 Publications Standing Committee

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This committee has the responsibility of interfacing with Publishers for the publication of Conference and Workshop proceedings, of interfacing with Reliability Engineering and System Safety, the ESRA Technical Journal, and of producing the ESRA Newsletter.

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E-mail: nicola.pedroni@ecp.fr;
edoardo.patelli@liverpool.ac.uk

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E-mail: jana.markova@klok.cvut.cz;
martin.krejsa@vsb.cz

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E-mail: gregory.levitin@iec.co.il;
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E-mail: emanuele.borgonovo@unibocconi.it;
roger.flage@uis.no

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E-mail: valerio.cozzani@unibo.it;

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E-mail: raphael.steenbergen@tno.nl

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E-mail: sansavig@ethz.ch; enrico.zio@ecp.fr

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ralf.mock@zhaw.ch

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E-mail: benoit.iung@univ-lorraine.fr;

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E-mail: j.wang@ljmu.ac.uk; ingrid.b.utne@ntnu.no;

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E-mail: p.h.a.j.m.vangelder@tudelft.nl;

.Kolen@tudelft.nl

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francesco.dimaio@polimi.it

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genserik.reniers@uantwerpen.be

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E-mail: sissel.h.jore@uis.no; zdenek.vintr@unob.cz;

genserik.reniers@uantwerpen.be



ESRA is a non-profit international organization for the advance and application of safety and reliability technology in all areas of human endeavour. It is an “umbrella” organization with a membership consisting of national societies, industrial organizations and higher education institutions. The common interest is safety and reliability.

For more information about ESRA, visit our web page at <http://www.esrahomepage.eu>

For application for membership of ESRA, please contact the general secretary Coen van Gulijk E-mail: c.vangulijk@hud.ac.uk.

Please submit information to the ESRA Newsletter to any member of the Editorial Board:

Editor: **Carlos Guedes Soares** – c.guedes.soares@tecnico.ulisboa.pt
Instituto Superior Técnico, Lisbon

Editorial Board:

Ángelo Teixeira – angelo.teixeira@tecnico.ulisboa.pt

Instituto Superior Técnico, Portugal

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University of Technology of Troyes, France

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Francesco Di Maio - francesco.dimaio@polimi.it

Politecnico di Milano, Italy

Igor Kozine – igko@dtu.dk

Technical University of Denmark, Denmark

Sylwia Werbinska – sylwia.werbinska@pwr.wroc.pl

Wroclaw University of Technology, Poland

Eirik Albrechtsen – eirik.albrechtsen@iot.ntnu.no

Norwegian University of Science Technology, Norway

Luca Podofillini – luca.podofillini@psi.ch

Paul Scherrer Institut, Switzerland

Marko Cepin - marko.cepina@fe.uni-lj.si

University of Ljubljana, Slovenia

Jana Markova – jana.Markova@cvut.cz

Czech Technical University in Prague, Czech Republic

Sofia Carlos - scarlos@iqn.upv.es

Universidad Politécnica de Valencia, Spain

Reinder Roos - r.roos@delta-pi.nl

Soc. for Risk Analysis & Reliability, The Netherlands

Uday Kumar - uday.kumar@itu.se

Luleå University of Technology, Sweden

Zoe Nivolianitou – zoe@ipta.demokritos.gr

Demokritos Institute, Greece

Elena Zaitseva - elena.zaitseva@fri.uniza.sk

University of Žilina, Slovakia

Matthew Revie - matthew.j.revie@strath.ac.uk

University of Strathclyde, United Kingdom