



Risk and Reliability Symposium in Honor of Prof. Armen Der Kiureghian

I Hotel and Conference Center
University of Illinois at Urbana-Champaign

October 4-5, 2015



ILLINOIS

Introduction

Communities face a number of risks from natural hazards, such as earthquakes. “Managing such risks requires communities to make comparative judgments about the relative gravity of diverse risks. Such judgments are reflected in the priorities that communities set in terms of the risks that they will address through mitigation policy, and so the kinds of risks to which limited resources will be devoted.”¹

Risk analysis is an important tool for informed decision making. In this context, risk is typically defined in terms of the probabilities of occurrence and the associated consequences of hazardous scenarios. Reliability analysis can be used to quantify the safety of civil engineering assets and to estimate the probabilities related to structural performance that are needed in risk analysis.

Modern reliability analysis dates back to the beginning of the 20th Century, with significant contributions made in the second half of that century. Over the past few decades, reliability analysis has gone from a specialty topic to a mainstream subject in civil engineering. Currently it is being used in the development of design codes and the assessment of a number of assets ranging from bridges to buildings, and from nuclear power plants to offshore structures.



This Reliability and Risk Analysis Symposium brings together some of the most prominent scholars in this field to honor Prof. Armen Der Kiureghian. Prof. Der Kiureghian is one of the fathers of modern risk and reliability analysis. During his career, he has made fundamental and revolutionary research contributions to the areas of structural reliability, risk analysis, random vibrations and earthquake engineering. He has pioneered methods for safety and reliability assessment of complex structures and for stochastic seismic analysis of buildings, bridges and critical equipment. During his career, Prof. Der Kiureghian has also created, through his advising, a legacy of scholars that will be future leaders in this field.

Prof. Der Kiureghian is the former Taisei Professor of Civil Engineering in the Department of Civil & Environmental Engineering at the University of California, Berkeley and current President of the American University of Armenia. He received his B.S. and M.S. in Civil Engineering from the University of Tehran, Iran and his Ph.D. in Structural Engineering from the University of Illinois at Urbana-Champaign in 1975. Prof. Der Kiureghian joined the faculty at the University of California, Berkeley after three years as a faculty at the University of Southern California.

In recognition of his achievements, he is a member of a number of societies and associations and is the recipient of several awards, including

- Elected Member of the US National Academy of Engineering;
- Elected Foreign Member of the National Academy of Engineering of Armenia;
- Elected Foreign Member of the National Academy of Sciences of Armenia;
- Alfred M. Freudenthal Medal from the Engineering Mechanics Division of ASCE;
- George Winter Medal from the Structural Engineering Institute of ASCE; and
- Distinguished Alumnus of the Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign.

¹ Gardoni, P., and Murphy, C., (2014). “A scale of risk,” *Risk Analysis*, 34 (7), 1208-1227.

Events, Locations, and Facilities

October 4, Welcome Reception

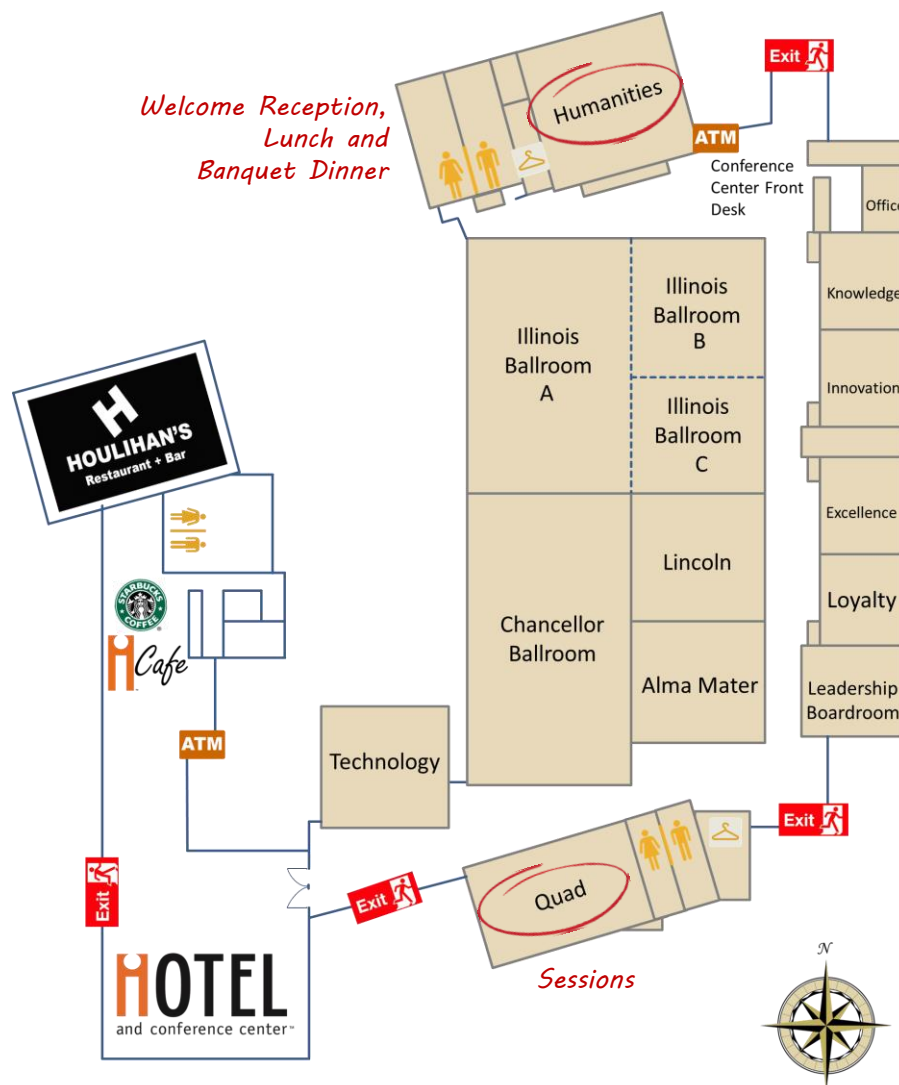
All the speakers and their guests are invited to a welcome reception on the evening of October 4. The reception will be at 6:00 PM in the Humanities Room of the I Hotel and Conference Center.

October 5, Lunch and Banquet Dinner

There will be a lunch and a banquet dinner on October 5 for all the speakers and their guests. The lunch and dinner will be in the Humanities Room. The lunch will start at 12:00 PM and the banquet dinner at 7:00 PM.

October 5, Sessions

The symposium has four sessions with technical presentations preceded by anecdotal presentations. All of the symposium sessions will be held in the Quad Room of the I Hotel and Conference Center. The detailed schedule of the presentations is provided on Pages 4-5.



Contact

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Founder and Editor-in-Chief, Sustainable and Resilient Infrastructure
(<http://www.tandfonline.com/loi/tsri20#.VffaxzZwbcs>)

Website

The symposium has a dedicated website where additional information and last-minute changes are posted. The URL to the symposium website is <http://mae.cee.illinois.edu/Symposium/>.

Everybody is welcome to attend the symposium. There is no fee for attending.

Presentation Time

Each presentation will be limited to 15 minutes which includes, for the technical presentations, time to answer questions.

Edited Volume

The technical papers presented at the symposium will be submitted for publication in an edited volume published by a prestigious press. Additional details for the authors, including the deadline to submit the full contribution along with a template and page limit, will be provided shortly following the symposium.

Sponsors

MAE Center: Creating a Multi-hazard Approach to Engineering
CEE Structures Engineering Program
CEE Societal Risk Management (SRM) Program

Detailed Program

Opening Session


8:00 - 8:15 AM	Paolo Gardoni	Opening Remarks
8:15 - 8:30 AM	Benito Mariñas	Welcome Remarks

Morning Session 1 8:30 - 10:00 AM

Anecdotes and Perspectives

8:30 - 8:45 AM	Masoud M. Zadeh
8:45 - 9:00 AM	Charles Menun

Technical Presentations

9:00 - 9:15 AM	Al Ang
9:15 - 9:30 AM	Marco Broccardo
9:30 - 9:45 AM	 Daniel Straub
9:45 - 10:00 AM	Katerina Konakli

Intuitive Basis of the Probability Density Evolution Method (PDEM) for Structural Dynamics
The Tail Equivalent Linearization Method for Nonlinear Stochastic Dynamics Analysis, Genesis and Developments
Reliability Updating in the Presence of Spatial Variability
Seismic Response Analysis with Spatially Varying Stochastic Excitation


Coffee Break 10:00 - 10:15 AM

Morning Session 2 10:15 AM 12:00 PM

Anecdotes and Perspectives

10:15 - 10:30 AM	Takeru Igusa
10:30 - 10:45 AM	Philippe V. Geskens

Technical Presentations

10:45 - 11:00 AM	 Anne Kiremidjian
11:00 - 11:15 AM	Petros Keshishian
11:15 - 11:30 AM	James-A. Goulet
11:30 - 11:45 AM	Jean-Marc Bourinet
11:45 AM - 12:00 PM	Matteo Pozzi

Modeling Dynamic Seismic Risk
Seismic Risk Assessment of Public Buildings in Four Cities in Armenia
Data-driven Post-earthquake Rapid Structural Safety Assessment
Adaptive SVM Surrogate Models for Reliability Assessment
Model Checking after Bayesian Inference

Lunch 12:00 - 1:00 PM

Afternoon Session 1 1:00 - 2:45 PM

Anecdotes and Perspectives

1:00 - 1:15 PM	Johannes O. Royset
1:15 - 1:30 PM	Binbin Li

Technical Presentations

1:30 - 1:45 PM	Junho Song
1:45 - 2:00 PM	Terje Haukaas
2:00 - 2:15 PM	Luis Esteve
2:15 - 2:30 PM	Paolo Franchin
2:30 - 2:45 PM	Iris Tien

Structural System Reliability, Reloaded
A Framework of Models to Minimize the Total Expected Cost of Structural Designs
Challenges and Trends for the Establishment of Reliability-Based Seismic Design of Irregular Buildings
Bayesian Networks and Infrastructure Systems: Computational and Methodological Challenges
Bayesian Network Methods for Modeling and Reliability Assessment of Infrastructure Systems


Coffee Break **2:45 - 3:15 PM**

Afternoon Session 2 3:15 - 5:00 PM

Anecdotes and Perspectives


3:15 - 3:30 PM	Mehrdad Sasani
3:30 - 3:45 PM	Mayssa Dabaghi

Technical Presentations

3:45 - 4:00 PM	Bruno Sudret	Reliability Analysis with Surrogate Models: From Polynomial Chaos Expansions to Low-rank Tensor Approximations
4:00 - 4:15 PM	Gian Paolo Cimellaro	Fragility Curves of Restoration Processes For Resilience Analysis
4:15 - 4:30 PM	Umberto Alibrandi	Decision Support Tool for Probabilistic Sustainable Building Design
4:30 - 4:45 PM	Chin-Man Mok	Application of Reliability Methods to Hydraulic Tomography
4:45 - 5:00 PM	 Smitha Koduru	State-of-the-Art Review of Quantitative Risk and Reliability Methods in Onshore Oil and Gas Pipelines

Banquet Dinner **7:00 PM**

Closing Remarks

7:15 - 7:30 PM	Bruce Ellingwood	Letter read by Paolo Gardoni
7:30 - 7:45 PM	 Khalid Mosalam	Passing the Torch
7:45 - 8:00 PM	Nelly and Naira Der Kiureghian	
8:00 - 8:15 PM	Armen Der Kiureghian	



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Creating a Multi-hazard Approach to Engineering



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