



Department of Civil Engineering
The University of Hong Kong

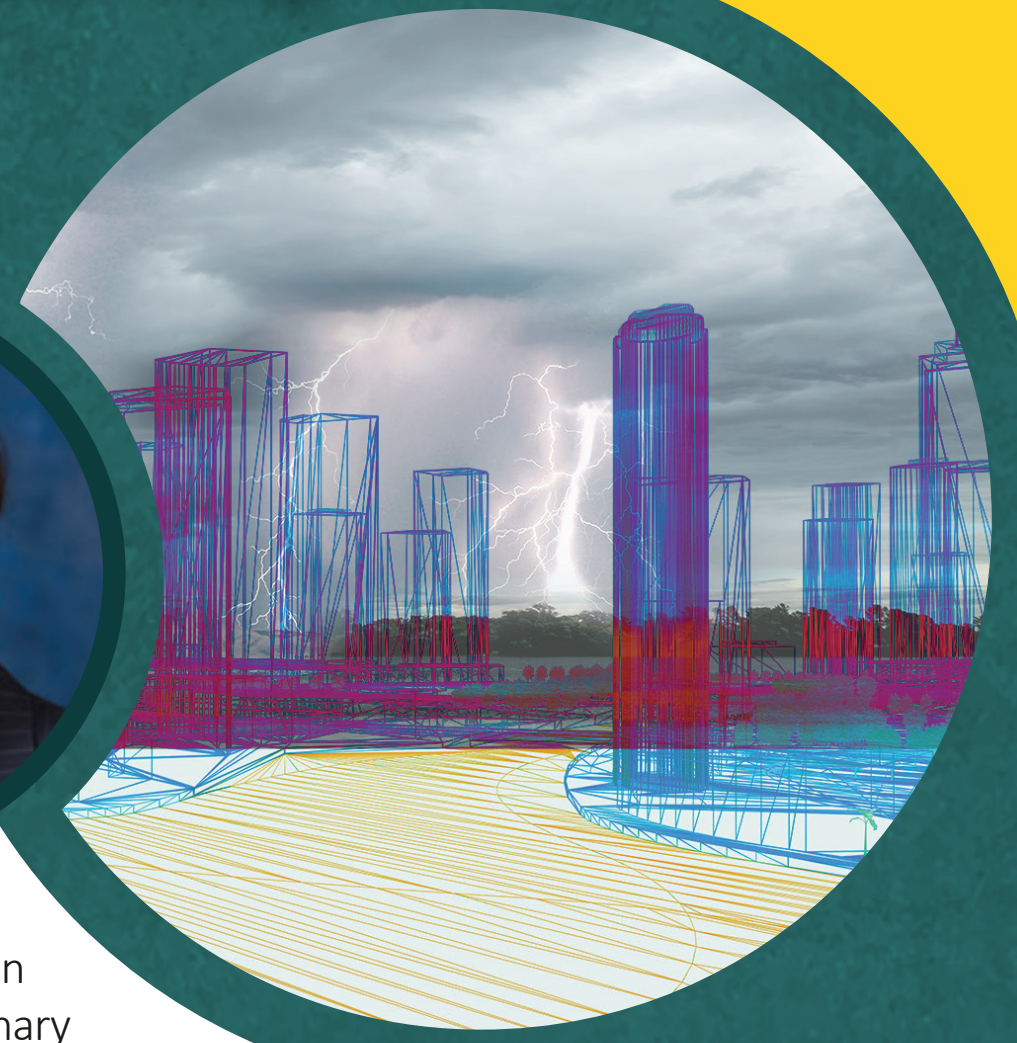
Distinguished Public Lecture (ONLINE)

Engineering for Extremes: A Nexus of Simulation, Stochastics, Virtualization, and Scientific Machine Learning

 Date: May 31, 2023 (Wednesday)
 Time: 9:00 a.m. to 10:00 a.m. (Hong Kong Time)
 Zoom: <https://hku.zoom.us/j/98101739905>
(Meeting ID: 981 0173 9905)

Professor Ahsan Kareem

*NatHaz Modeling Laboratory
University of Notre Dame, USA*



Abstract

There is a recent trend in the escalation of the extremes of natural hazards around the globe with an emphasis on meteorological hazards. Over the last several decades, wind engineering a multi-disciplinary subject involving engineering meteorology, fluid dynamics, structural dynamics, structural engineering, probabilistic methods, and design has addressed the challenges posed by extremes in winds of synoptic and non-synoptic origins. During this period, we have seen extraordinary advances in experimental facilities, instrumentation, and data acquisition and management. These advances have enabled us to build a cadre of civil infrastructure that meets some of the challenges posed by extreme windstorms. Yet there remain several frontiers that still need to be addressed. Fortunately, amidst these challenges, there are new opportunities to complement our existing capabilities as the burgeoning growth in computational resources and parallel computational advances coupled with data analytics and AI-based schemes, e.g., machine learning holds the promise of expanding our modeling and simulation capacity far beyond our current conventional schemes offer. This presentation provides a synopsis of the challenges posed by extremes and expands on new computational opportunities to address emerging challenges in building resilient and sustainable civil infrastructure as we shift from code-based and performance-based to resilience-based design.

About the Speaker

Ahsan Kareem is the Robert M. Moran Professor of Engineering in the Department of Civil & Environmental Engineering and Earth Sciences (CEEES) at the University of Notre Dame. He is the Director of the *NatHaz* Modeling Laboratory and has served as the Chair of the Department of CEEES at the University of Notre Dame.

The focus of his work is on quantifying load effects caused by various natural hazards on structures and developing innovative strategies to manage and mitigate their effects. The characterization and formulation of dynamic load effects due to wind, waves, and earthquakes on tall buildings, long-span bridges, offshore structures, and other structures are carried out via fundamental analytical computational methods, and experiments at laboratory, and full-scale. He directs NatHaz Group (NatHaz Modeling Laboratory) which focuses on developments in cyberspace virtual collaborative research platforms, e.g., virtual organizations, crowdsourcing, computational intelligence, living laboratories, sensing and actuation, citizen sensing, web-enabled analysis and design, scientific machine learning (SciML) and cloud-based computing.

Additional details https://en.wikipedia.org/wiki/Ahsan_Kareem



Registration is required only for participants who require attendance certificate:
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An electronic certificate of attendance will be issued to registered participants after the public lecture.



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