



JEROME P. LYNCH



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2023 Khan Distinguished Lecture Series

The Fazlur Rahman Khan Distinguished Lecture Series honors Dr. Fazlur Rahman Khan's legacy of excellence in structural engineering and architecture

Initiated and Organized by PROFESSOR DAN M. FRANGOPOL

The Fazlur Rahman Khan Endowed Chair of Structural Engineering and Architecture
Department of Civil and Environmental Engineering, ATLSS Engineering Research Center,
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Vinik Dean of Engineering, Fitzpatrick Family University Distinguished Professor of Engineering,
Professor of Civil and Environmental Engineering, Professor of Electrical and Computer Engineering
Duke University, Durham, NC

“Elevating the Performance of the Built Environment through Cyberphysical Systems”

Monday, December 4, 2023 – 4:30 pm

Location: Whitaker Lab 303, Lehigh University, 5 E. Packer Avenue, Bethlehem, PA

Lecture will also be live streamed, [must REGISTER HERE for live stream link](#)

<http://www.lehigh.edu/frkseries>

In step with the abounding vitality of the time, structural engineer **Fazlur Rahman Khan** (1929-1982) ushered in a renaissance in skyscraper construction during the second half of the 20th century. Fazlur Khan was a pragmatic visionary: the series of progressive ideas that he brought forth for efficient high-rise construction in the 1960s and '70s were validated in his own work, notably his efficient designs for Chicago's 100-story John Hancock Center and 110-story Sears Tower -- the tallest building in the United States since its completion in 1974.



Fazlur Rahman Khan

Lehigh endowed a chair in structural engineering and architecture and has established this lecture series in Khan's honor. It is organized by **Professor Dan M. Frangopol**, the university's first holder of the Fazlur Rahman Khan Endowed Chair of Structural Engineering and Architecture, and sponsored by the Departments of Civil & Environmental Engineering, and Art, Architecture & Design.

Dr. Jerome Lynch is the Vinik Dean of Engineering and Fitzpatrick Family University Distinguished Professor of Engineering at Duke University. Prior to joining Duke in 2022, he was a tenured faculty member in the Department of Civil and Environmental Engineering at the University of Michigan including serving as the Department Chair of Civil and Environmental Engineering. Dr. Lynch's research interests are in advancing cyber-physical system (CPS) architectures that combine sensing, computing, and controls to create intelligent infrastructure systems. He is best known for his research portfolio in structural health monitoring. He was the founding Director of the University of Michigan Urban Collaboratory, a cross-campus research institute that facilitates close collaboration with city stakeholders to prototype solutions to community challenges using information technologies and socially engaged design methods. Dr. Lynch's impact has been recognized by several honors including the 2009 Presidential Early Career Award for Scientists and Engineers, 2012 ASCE Leonardo da Vinci Award, and 2014 ASCE Huber Award. He was also elected Fellow of the ASCE Engineering Mechanics Institute in 2021. Dr. Lynch completed his graduate studies at Stanford University where he received his Ph.D. in Civil and Environmental Engineering, M.S. in Civil and Environmental Engineering, and M.S. in Electrical Engineering. Dr. Lynch also received his B.E. in Civil and Environmental Engineering from the Cooper Union.

Elevating the Performance of the Built Environment through Cyberphysical Systems. The increasing number of sensing and information technologies being integrated into our built environment is a driving force of smart cities. Fundamentally, smart city solutions are part of the broader family of cyber-physical systems (CPS) that embed cloud-enabled sensors and actuators in physical systems with cloud-based data analytics used to enhance system performance. The introduction of CPS architectures into the infrastructure domain offers a historic opportunity for the civil engineering profession to serve as the technological leaders of smart cities. This presentation gives a review of experiences in the design and deployment of CPS architectures into real-world operational infrastructure systems. First, a CPS framework for the asset management of bridges in a highway corridor will be introduced. Computer vision for traffic tracking is combined with bridge monitoring systems to quantitatively assess structural health and performance by linking measurement of traffic loads and bridge responses. Second, extensions of the CPS framework illustrated on bridges are explored to assess the use and benefits of social infrastructure in cities such as parks and public spaces. The talk concludes with an outlook for the future opportunities for the impact of CPS in other smart city applications.

FAZLUR RAHMAN KHAN (1929 - 1982) One of the foremost structural engineers of the 20th century, Fazlur Khan epitomized both structural engineering achievement and creative collaborative effort between architect and engineer. Only when architectural design is grounded in structural realities, he believed — thus celebrating architecture's nature as a constructive art, rooted in the earth — can “the resulting aesthetics ... have a transcendental value and quality.” His ideas for these sky-scraping towers offered more than economic construction and iconic architectural images; they gave people the opportunity to work and live “in the sky.” Hancock Center residents thrive on the wide expanse of sky and lake before them, the stunning quiet in the heart of the city, and the intimacy with nature at such heights: the rising sun, the moon and stars, the migrating flocks of birds. Fazlur Khan was always clear about the purpose of architecture. His characteristic statement to an editor in 1971, having just been selected Construction's Man of the Year by *Engineering News-Record*, is commemorated in a plaque in Onterie Center (446 E. Ontario, Chicago): “*The technical man must not be lost in his own technology. He must be able to appreciate life; and life is art, drama, music, and most importantly, people.*”



1 PDH will be awarded to eligible attendees for each lecture (minimum webinar participation time of 55 minutes is required)

Please contact the Khan Chair office at 610-758-6123 or Email: infrk@lehigh.edu with any questions.