

NEWS RELEASE 12-DEC-2024

## Dan M. Frangopol and Sunyong Kim co-author third book on structural performance

"System Reliability, Risk, Longevity, Sustainability and Optimal Decision-Making"—latest collaboration by Lehigh Univ. structural engineering professor and his former doctoral student, now a professor at Wonkwang Univ.—will be published in April

### Book Announcement

LEHIGH UNIVERSITY

[Dan M. Frangopol](#), the inaugural Fazlur R. Khan Endowed Chair of Structural Engineering and Architecture at Lehigh University, has co-authored a new book on probabilistic structural performance assessments.

[System Reliability, Risk, Longevity, Sustainability and Optimal Decision-Making: Emphasis on Marine Structures](#) (available April 11, 2025) offers a comprehensive framework for analyzing and predicting the time-dependent performance of deteriorating structures. The book emphasizes marine infrastructure, addressing system reliability, risk, longevity, sustainability, and optimal decision-making processes. It is a valuable resource for students, engineers, researchers, decision-makers, and policymakers.

Frangopol, a globally recognized leader in life-cycle engineering, co-wrote the book with Sunyong Kim, a professor in the Department of Civil and Environmental Engineering at Wonkwang University in South Korea. Kim earned his PhD in structural engineering from Lehigh in 2011, with Frangopol as his advisor.

This marks the duo's third collaboration, following [Life-Cycle of Structures Under Uncertainty](#) (2019) and [Bridge Safety, Maintenance and Management in a Life-Cycle Context](#) (2022).

The new book introduces advanced methodologies for integrating maintenance strategies and structural health monitoring to extend infrastructure service life. Topics include data-driven decision-making, multi-objective optimization, cost-benefit analysis, and the role of data analytics in managing uncertainties and optimizing maintenance plans for marine and civil structures.

Frangopol's main research interests lie in applying probabilistic and optimization methods to civil and marine structures under various hazards. His contributions have earned numerous awards from organizations including the American Society of Civil Engineers (ASCE), the International Association for Bridge and Structural Engineering (IABSE), and the International Society for Structural Health Monitoring of Intelligent Infrastructure (ISHMII), among others.

In 2023, ASCE established the [Dan M. Frangopol Medal for Life-Cycle Engineering of Civil Structures](#) to honor his groundbreaking work.

He has authored/coauthored four books, 70 book chapters, and more than 490 peer-reviewed journal articles, including 15 award-winning papers. He holds 5 honorary doctorates and 14 honorary professorships and has achieved membership in eight academies, spanning the U.S., Canada, Mexico, Japan, Belgium, Romania, Europe, and beyond.

He is the Founding President of the International Association for Bridge Maintenance and Safety (IABMAS) and the International Association for Life-Cycle Civil Engineering (IALCCE), and

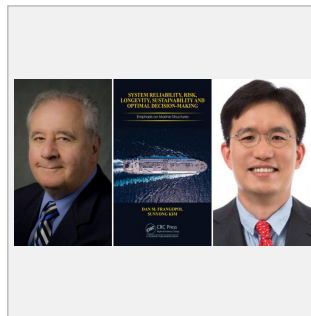


IMAGE:

[System Reliability, Risk, Longevity, Sustainability and Optimal Decision-Making: Emphasis on Marine Structures](#) (AVAILABLE APRIL 11, 2025) OFFERS A COMPREHENSIVE FRAMEWORK FOR ANALYZING AND PREDICTING THE TIME-DEPENDENT PERFORMANCE OF DETERIORATING STRUCTURES. THE BOOK (CENTER) IS THE THIRD COLLABORATION OF [Dan M. Frangopol](#) (LEFT), THE INAUGURAL FAZLUR R. KHAN ENDOVED CHAIR OF STRUCTURAL ENGINEERING AND ARCHITECTURE AT LEHIGH UNIVERSITY, AND SUNYONG KIM (RIGHT), A PROFESSOR IN THE DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING AT WONKWANG UNIVERSITY IN SOUTH KOREA.

[view more >](#)

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### More on this News Release

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LEHIGH UNIVERSITY

### KEYWORDS

STRUCTURAL ENGINEERING

ECONOMIC DECISION MAKING

SOCIAL DECISION MAKING

COST EFFECTIVENESS SUSTAINABILITY

TRANSPORTATION INFRASTRUCTURE

MARINE RESOURCES

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MATHEMATICAL OPTIMIZATION

### ORIGINAL SOURCE

<https://engineering.lehigh.edu/news/article/cee-prof-frangopol-and-alum-kim-11-phd-co-author-third-book-structural-performance>

the Founder and Editor-in-Chief of *Structure and Infrastructure Engineering*, an international peer-reviewed journal.

Kim has earned notable awards, including the 2014 ASCE J. James R. Croes Medal and the 2022 ASCE Arthur M. Wellington Prize.

This new book marks their third collaboration, continuing their research on life-cycle performance and risk assessment of structures.

Read more about Frangopol's research and achievements [here](#).

#### Related Links

- [Website: Dan M. Frangopol](#)
- [Book: "System Reliability, Risk, Longevity, Sustainability and Optimal Decision-Making"](#)
- [Google Scholar: Sunyong Kim](#)

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