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Lehigh University team wins 2024 Alfred Noble Prize for work on optimizing bridge maintenance

Xu Han '23 PhD and Prof. Dan M. Frangopol receive interdisciplinary honor for innovative life-cycle approach for infrastructure facing multi-hazard risks

Grant and Award Announcement

LEHIGH UNIVERSITY

Lehigh University structural engineering alum Xu Han '23 PhD and his doctoral advisor Professor Dan M. Frangopol have been awarded the 2024 Alfred Noble Prize, an esteemed interdisciplinary award from a consortium of professional societies, administered by the American Society of Civil Engineers (ASCE).

"I feel very humbled for receiving such a prestigious award and am very grateful to people nominating me," says Han, who is now a postdoctoral research fellow at Texas A&M University.

Frangopol, Lehigh's inaugural Fazlur R. Khan Endowed Chair of Structural Engineering and Architecture, is a world-renowned expert in bridge safety and maintenance management, structural system reliability, and life-cycle civil engineering.

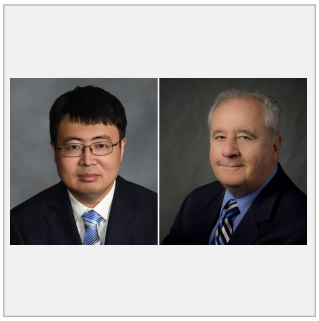

IMAGE:

LEHIGH UNIVERSITY STRUCTURAL ENGINEERING ALUM Xu Han '23 PhD AND HIS DOCTORAL ADVISOR PROFESSOR Dan M. Frangopol HAVE BEEN AWARDED THE 2024 Alfred Noble Prize, AN ESTEEMED INTERDISCIPLINARY AWARD FROM A CONSORTIUM OF PROFESSIONAL SOCIETIES, ADMINISTERED BY THE AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE).

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The award recognizes a technical paper of exceptional merit selected by an intersociety awards committee of five organizations including ASCE, the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME); the American Society of Mechanical Engineers (ASME); the Institute of Electrical and Electronics Engineers (IEEE); and the Western Society of Engineers (WSE). The honor is named after a former ASCE president, Alfred Noble (distinct from Alfred Nobel, the namesake of the Nobel Prize), who made significant contributions to canal and railroad tunnel engineering around the turn of the 20th century.

Han and Frangopol were honored for their paper "Life-cycle Risk-based Optimal Maintenance Strategy for Bridge Networks Subjected to Corrosion and Seismic Hazards," which was published in the *Journal of Bridge Engineering* in January 2023. The paper describes a study on creating an optimal maintenance strategy for bridge networks facing corrosion and earthquake risks.

"The risk-based life-cycle management strategy focuses on multi-hazards, which is a more and more common scenario facing infrastructure systems nowadays," says Han. "This research endeavor underscores the importance of conducting multi-hazard life-cycle management for infrastructure systems rather than doing life-cycle management for each individual hazard separately. Hopefully, this paper will bring greater attention to the research topic of multi-hazard life-cycle management and lead to more research work in that regard."

This is the second time Frangopol has won the Alfred Noble Prize, having received the honor in 2015 with his former doctoral student Mohamed Soliman '15 PhD. Frangopol is the only individual to have received the award twice since it was established in 1929, according to the ASCE website. He has received numerous other awards from ASCE, which also recently established the Dan M. Frangopol Medal for Life-Cycle Engineering of Civil Structures in his honor.

Read more about Frangopol's research and achievements here.

"The work with Dr. Frangopol gave me a solid knowledge base in multiple research areas, and more importantly, cultivated a sense of producing more high-quality research inside me, which is crucial in the path of pursuing an academic career," says Han, who is now working on resilience analysis for communities subjected to natural hazards for his postdoc at Texas A&M.

This year's Alfred Noble Prize will be formally presented at ASCE's 2024 Annual Convention, October 6-9, in Tampa, Florida.

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