NGSEA SEMINAR SERIES

Friday, Nov. 10, 10:30 AM- 11:30 AM Shillman Hall 215

Recent Research on Ductile Fracture in Civil Steel Structures

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ABSTRACT

As structural engineering design relies increasingly on performance based design, simulation of extreme limit states such as fracture is gaining importance. The 1994 Northridge earthquake catalyzed research into earthquake induced fracture in steel structures, resulting in fundamental models to simulate ductile fracture and Ultra Low Cycle Fatigue. While these models overcome many limitations of conventional fracture mechanics, they raise challenges of their own – operating at mesomechanical scales that are several orders of magnitude lower than structural scales at which performance assessment is desired. Bridging these scale gaps requires addressing several complex phenomena. Within this setting, two ongoing research initiatives are discussed. These include (1) simulation of crack propagation under Ultra Low Cycle Fatigue, and (2) simulation of ductile fracture under spatial randomness in material properties.

Speaker Bio

Amit Kanvinde is Professor and Chair of Civil and Environmental Engineering at the University of California at Davis. He is interested in the seismic response and design of steel structures, with an emphasis understanding and simulating extreme limit states, such as fracture, fatigue, and collapse. His research combines large and small-scale experiments with model-based simulation to develop a more fundamental understanding of the response of structural systems. Professor Kanvinde received the 2008 Norman Medal, and the 2016 Walter Huber Research prize, both presented by the American Society of Civil Engineers. Most recently, he received the Special Achievement Award from the American Institute of Steel Construction.

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