

The Department of Civil and Environmental Engineering at the University of Houston presents...

The CIVE 6111 Graduate Seminar Series

The Promise of Smart Materials in Earthquake Resistant Design



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Friday, September 7, 2018
2:45PM-3:45PM
Classroom Business Building (CBB) Room 108

Abstract

Damage from recent earthquakes underscores the importance of developing new approaches and technologies to improve the performance of structures during earthquakes. The presentation will highlight applications of one class of smart materials, shape memory alloys, in improving the performance of structures subjected to earthquake loading. Shape memory alloys belong to a class of shape memory materials which can undergo large deformations while reverting back to their original, undeformed shape. This unique property has led to the development of numerous applications in the biomedical, aerospace, and commercial industry. A multi-scale and multi-disciplinary approach is taken to explore the potential use of these systems for applications in earthquake engineering. Component testing, full-scale testing, and detailed analyses show great potential for these systems to significantly improve the earthquake performance of nonductile buildings and bridges.

Bio

Reginald DesRoches is the William and Stephanie Sick Dean of the George R. Brown School of Engineering at Rice University, as of July 1, 2017. He earned both a bachelor's degree in mechanical engineering and a Ph.D. in structural engineering at the University of California, Berkeley. A fellow of the American Society of Civil Engineers (ASCE), DesRoches' research focuses on the design of resilient infrastructure systems under extreme loads and the application of smart and adaptive materials.

DesRoches serves on the National Academies Resilient America Roundtable, the Board on Army Science and Technology, the National Science Foundation's Engineering Advisory Committee, the Global Earthquake Modeling Scientific Board and the advisory board for the Natural Disasters, Coastal Infrastructure and Emergency Management Research Center. He chaired the ASCE's Seismic Effects Committee and the executive committee of the Technical Council on Lifeline Earthquake Engineering.

Among DesRoches' honors are the 2015 ASCE Charles Martin Duke Lifeline Earthquake Engineering Award, the 2007 ASCE Walter L. Huber Civil Engineering Research Prize and the 2008 Georgia Tech ANAK Award, which is the highest honor the undergraduate student body can bestow on faculty members. He was elected to the UC Berkeley Civil Engineering Department Academy of Distinguished Alumni in 2015.