UNIVERSITY of HOUSTON

CULLEN COLLEGE of ENGINEERING

Department of Civil & Environmental Engineering

CIVE 6111 Graduate Seminar Series

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Civil and Environmental Engineering
Chemical Engineering and Material Science
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Magnetorheological CNT Nanocomposites and Their Viscoelastic Responses

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10:30 am - 11:30 am
Room: D3 W205

Abstract
Magnetorheological (MR) elastomer composites with the addition of multi-walled carbon nanotubes are developed. The viscoelastic responses of the MR nanocomposites to applied magnetic fields are investigated through dynamic mechanical analysis. It is found that a small amount of carbon nanotubes can effectively improve the mechanical performance of conventional MR elastomers. The MR nanocomposites have shown not only large jumps in zero-field dynamic stiffness and damping, but also higher magnetic-field-induced improvement in these dynamic mechanical properties. In addition, a micromechanics-based viscoelastic constitutive model of nanocomposites was developed with a particular focus on the effect of imperfect interface between matrix polymer and carbon nanotubes.

About the speaker:

Dr. Lizhi Sun is Professor of Department of Civil and Environmental Engineering (CEE) at University of California, Irvine (UCI). He also has secondary appointment of Professor in UCI Department of Chemical Engineering and Materials Science. Dr. Sun received his B.S. degree in Engineering Mechanics from Zhejiang University (China) in 1987, his M.S. degree in Solid Mechanics from Peking University (China) in 1990, and his Ph.D. in Civil Engineering from University of California – Los Angeles (UCLA) in 1998. Dr. Sun's primary area of research is the micro/nano-mechanics of heterogeneous composite materials, with applications in civil, mechanical, aerospace, electronics, and biomedical engineering. His research has been sponsored by NSF, Army, Air Force, Navy, and Honda R&D. He has published more than 160 papers including 80 peer-reviewed journal papers in the fields of mechanics and materials, applied physics, and biomedical engineering. He wins numerous academic and research awards such as ASCE Engineering Mechanics Institute Fellow (2014), UCI Civil and Environmental Engineering Professor of the Year (2013), AFRL Faculty Fellow (2011), UCI School of Engineering Fariborz Maseeh Best Faculty Research Award (2008), and Honda Research Initiation Award, (2006). He is an associate editor or editorial board member for International Journal of Damage Mechanics, ASCE Journal of Engineering Mechanics, ASCE Journal of Nanomechanics and Micromechanics, ASCE Lecture Notes in Mechanics, and International Journal of Biomedical Imaging. He is a member of ASCE, ASME, MRS, and AAAS and has been the committee chair for ASCE Committee on Inelasticity Modeling and Multiscale Behavior (2009-2011), ASCE Committee on Nanocomposites (2012-2013), and ASCE Committee on Nanomechanics and Micromechanics (2014-Present).