Civil Engineering Seminar

Sonny Astani Department of Civil & Environmental Engineering Presents

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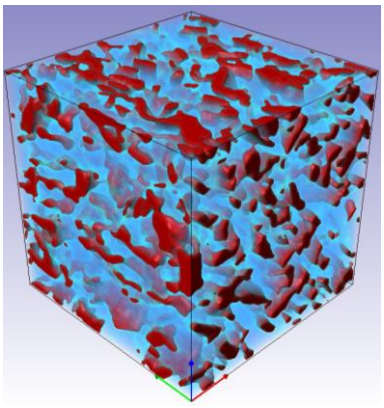
Date: January 23, 2019
Time: 11:30 am – 12:30 pm
Place: RRI 101

Magnetorheological CNT Nanocomposites and Their Field-dependent Viscoelastic Responses

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 in Departments of Civil & Environmental Engineering and Chemical Engineering & Materials Science at the University of California, Irvine (UCI). His primary area of research is the micro/nano-mechanics of heterogeneous composite materials, with applications in civil, mechanical, and aerospace engineering. His research

has been sponsored by US federal funding agencies such as NSF, Army, Air Force, and Navy. He has published more than 200 papers including 95 peer-reviewed journal papers in the field of mechanics and materials. He wins numerous academic and research awards such as Fellow of AAAS (2017), Fellow of ASCE's Engineering Mechanics Institute (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), Honda Research Initiation Award (2006), and UCLA Engineering School Outstanding Ph.D. Award (1998). Dr. Sun is an editor for International Journal of Damage Mechanics and an associate editor for ASCE's Journal of Engineering Mechanics. He has organized more than 50 symposia for various societies and served as a reviewer for more than 70 journals and 10 funding agencies (e.g. NSF, NIH, and DoD). Dr. Sun has been the technical committee chair for ASCE-EMI Committee on Inelasticity Modeling and Multiscale Behavior (2009-2011), ASCE-EMI Committee on Nanocomposites (2012-2013), and ASCE-EMI Committee on Nanomechanics and Micromechanics (2014-2017).