2010-2011

Graduate Seminar Series

The Department of Mechanical Engineering – Engineering Mechanics

Proudly Presents

Dr. Jason Foley
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Dr. Jason Foley earned a BS in physics (1998) and MS in aerospace engineering (1999) from Auburn University and MS (2002) and PhD (2007) degrees in mechanical engineering from Cornell University. Dr. Foley is employed by the Air Force Research Laboratory Munitions Directorate, Fuzes Branch (RWMF) where he performs basic and applied research in survivable electronics, sensors, and structural dynamics.

Thursday, Apr. 7, 2011 4:00 – 5:00 p.m. Room 112, ME-EM Bldg.

Broadband Mechanics of Structures Under Shock

The realm of impact and penetration presents a challenging set of environments for the design of shock survivable electromechanical systems. Survivable systems must be designed to withstand this harsh environment; intelligent survivable systems and their test instrumentation must also possess the capability to sense and interpret both internal and external dynamics during such events. This presentation explores the state of the art in shock experimentation, simulation, and analysis of these survivable systems.

The talk will begin with a brief survey of a few of the many outstanding research challenges in the world of shock mechanics. Next, the tools used in penetration and impact research will be discussed, with an emphasis on shock test methods and high bandwidth instrumentation (sensors and data acquisition). Results from some structural dynamics experiments are also discussed, with an emphasis on the role of interfaces in the nonlinear response of the systems under study. Two reduced-order computational approaches, wavelet- and Fourier-spectral element modeling, are presented that promise to increase the fidelity of impact/penetration simulations. Finally, new applications in broadband structural dynamics, such as microsecond structural health monitoring and wavelet-based system analysis, will be examined. Gratuitous explosions are shown throughout the presentation.

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