September 6, 2024

Impact and Vibration Control: The Design of Pounding Tuned Mass Damper (PTMD) and Applications

ABSTRACT: This talk presents an innovative passive damper that was recently developed at UH by using impact of a tuned mass with a viscoelastic layered restrainer to effectively dissipate vibration energy. Comparing to a traditional tuned mass damper (TMD), the proposed Pounding Tuned Mass Damper (PTMD) has the advantages of large damping capacity and robustness to the target frequency. A model for the pounding force o the PTMD was established. Different structures with PTMD were studied numerically and experimentally. Both numerical simulations and experiments show that the PTMD is extremely effective in suppressing structural vibration with various excitations and with inexactly known target frequencies.

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Seminar Details

Friday, September 6, 2024
2:30pm – 4:00pm

UH Campus
Classroom & Business Building
Room CBB 104

Online via Teams https://www.cive.uh.edu/research/beyer-distinguished-lecture

BIOGRAPHY: Dr. G. Song is the founding Director of the Smart Materials and Structures Laboratory and holds the John and Rebecca Moores Professorship at the University of Houston. He is a Professor of Mechanical Engineering, Civil and Environmental Engineering (joint), and Electrical & Computer Engineering (joint). Dr. Song is a recipient of the NSF CAREER award in 2001. Dr. Song received his Ph.D and MS degrees from the Department of Mechanical Engineering at Columbia University in the City of New York in 1995 and 1991, respectively. Dr. Song received his B.S. degree in 1989 from Zhejiang University, China. He has expertise in smart materials and structures, structural vibration control, and structural health monitoring and damage detection. He has developed two new courses in smart mateials and published more than 400 peer reviewed journal articles. Dr. Song is also an inventor or co-inventor of 28 US patents and 4 pending patents. He has received research funding in smart materials and related research from NSF, DoE, NASA, Department of Education, Texas Higher Education Board, TSGC (Texas Space Grant Consortium), UTMB (University of Texas Medical Branch), OSGC (Ohio Space Grant Consortium), OAI (Ohio Aerospace Institute), ODoT (Ohio Department of Transportation), HP OptiSolar, GE, Cameron, and OneSubsea. He received the prestigious Outstanding Technical Contribution Award from the Aerospace Division of ASCE, the Excellence in Research & Scholarship Award at Full Professor Level from UH, the Celebrating Excellence Award for Excellence in Education from ISA (International Society of Automation), the IEEE Educational Activities Board Meritorious Achievement Award in Informal Education, among others.