Bio-inspired Mobile Sensor Networks for Infrastructure Monitoring and Inspection

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Abstract

After millions of years of evolution, simple biological systems may illustrate far more superior performance than man-made sensing and actuation devices. In particular, bio-systems can shed light upon the development of future mobile sensor networks for the monitoring and inspection of infrastructure systems. A mobile sensor network contains multiple mobile sensing nodes that can move upon the members of a civil structure. On the mechanical side, insects and reptiles offer excellent examples for designing the adhesion and mobility of such mobile sensing nodes. On the algorithmic side, swarm intelligence can be enlightening for discovering new damage detection strategies that best utilize the advantages of mobile sensor networks, which provide adaptive sensor configuration and flexible spatial resolution. As part of an explorative investigation, prototype mobile sensor nodes have been developed for steel structure applications; their performance is illustrated with a laboratory steel portal frame.

Biography

Dr. Yang Wang is an Assistant Professor in the School of Civil and Environmental Engineering at the Georgia Institute of Technology. He received his Ph.D. degree in Civil Engineering at Stanford University in 2007, as well as an M.S. degree in Electrical Engineering. Dr. Wang's research interests include structural health monitoring and damage detection, decentralized structural control, smart materials

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