CE 295 - RESEARCH SEMINARS in STRUCTURAL & GEOTECHNICAL ENGINEERING

VISION-BASED STUDIES FOR HEALTH MONITORING AND CONDITION ASSESSMENT OF CIVIL INFRASTRUCTURE SYSTEMS

Date: Monday, April 21st
Time: 10:00AM-11:00AM
Room: CalIT2 Room 3008 – Seminar Room
Guest Speaker: Mohammad Jahanshahi, Ph.D.

Abstract:

Automated health monitoring and maintenance of civil infrastructure systems is an active yet challenging area of research. Visual inspection is the predominant method that is currently being used for the inspection of most infrastructure systems. This method is subjective, time-consuming, highly qualitative, and labor-intensive. Furthermore, it relies on an inspector's experience and mental focus, making it highly prone to human error. Because periodical inspections and maintenance of infrastructure systems prolong their service life, there is an urgent need to develop more effective approaches for the inspection and evaluation of infrastructure systems. Among several possible techniques, the use of optical instrumentation, image processing, and computer vision are promising approaches as contactless nondestructive testing methods for structural health monitoring to complement sensor-based approaches. In this presentation, the development of vision-based systems for robust condition assessment of structures will be discussed, some of which include an inspection software tool, a contactless crack detection and quantification system, and an inexpensive pavement condition assessment system. Several illustrative examples will be presented to demonstrate the capabilities, as well as the limitations, of the proposed vision-based inspection procedures.

Mohammad R. Jahanshahi is currently a Research Technologist in the Mobility and Robotic Systems Section at NASA's Jet Propulsion Laboratory (JPL), California Institute of Technology. Dr. Jahanshahi's research has been primarily focused on autonomous sensing, data interpretation, and intelligent condition assessment of structures, which are key elements toward achieving resilient and sustainable smart cities. He has been working in the field of computer vision, image processing and pattern recognition to develop robust inspection systems for health monitoring of civil infrastructures. Prior to joining JPL, Dr. Jahanshahi was a Caltech Postdoctoral Scholar at JPL (2012-2013) and a Postdoctoral Research Associate in the Sonny Astani Department of Civil and Environmental Engineering at the University of Southern California (2011-2012) where he earned his PhD in August 2011. He holds a BS in Civil Engineering from Shiraz University, a MS in Structural Engineering from Tarbiat Modarres University, and a MS in Electrical Engineering from USC.