

Course Title **Health Monitoring for Terrestrial and Space Based Environments**

Organized By Gangbing Song, M. ASCE, University of Houston, (GSong@uh.edu)
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Sponsored By American Society of Civil Engineers (ASCE) Aerospace Division (ASD)

Location Venue of the ASCE ASD Earth & Space 2022 Conference
 The Curtis Hotel, Denver, 1405 Curtis Street, Denver, CO 80202 USA
Remote online access is also available

Date and Time Monday, April 25, 2022; 9:00 AM – 5:00 PM

Professional Development Credit Attendees will receive 6.5 PDH from ASCE

This short course is designed for engineers and researchers who are focused on various aspects of health monitoring. This morning session of the short course teaches the basics about machine learning algorithms and their applications to detecting structural connection looseness. Structural connections are commonly used in many engineering fields, such as aerospace, mechanical, energy, and civil engineering, among others. The afternoon session is focused on the health monitoring of spacecraft, experiments, human and machine interaction and the human itself. A series of presentations will be given to familiarize the attendee in the latest research on these topics. It is intended for engineers working in a wide range of disciplines including spacecraft design and manufacture, human factors, robotics and astronaut physical health.

Duration (Estimate): Net 6.5 hours (9:00 AM – 5 PM, including 1 hour lunch break and two 15-minute breaks)

Tentative Schedule (Subject to Change)

Time	Topic	Instructor
8:45 am	Short Course Introduction	Gangbing Song Ph.D. University of Houston and Justin Littell Ph.D. NASA Langley Research Center
9:00 am	Machine Learning and Applications in Monitoring of Structural Connections Parts 1 and 2. Part 1 – Introduction to Machine Learning. Part 2 – Shallow Learning Methods and Applications of Monitoring Structural Connections	Gangbing Song Ph.D. Professor of Mechanical Engineering, University of Houston
10:30 am	Break	
10:45 am	Machine Learning and Applications in Monitoring of Structural Connections Part 3. Deep Learning Methods and Application in Monitoring of Structural Connections	Gangbing Song Ph.D. Professor of Mechanical Engineering, University of Houston
12:00 pm	Lunch break	
1:00 pm	NASA Applications of Structural Health Monitoring Technology On-Orbit	Bill Prosser Ph.D., NASA Technical Fellow, NASA Engineering Safety Center (NESC)
2:00 pm	On Orbit Flight Testing of the Roll Out Solar Array (ROSA) – Methods and Results	Matthew Chamberlain Ph.D., Research Aerospace Engineer, NASA Langley Research Center
2:45 pm	Break	
3:00 pm	Making Sense of How Users Make Sense of Robots: Applications to Human-Robot Teaming in Space Environments	Tom Williams Ph.D. Assistant Professor of Computer Science and Director of MIRRORLab, Colorado School of Mines
4:00 pm	Health Monitoring of Astronauts while on-orbit	Allison Anderson Ph.D. Assistant Professor Ann and H.J. Smead Aerospace Engineering Sciences, University of Colorado at Boulder