

Research Interest and Expertise

Structural Health Monitoring (SHM)

This research aims at monitoring the behavior of structures (e.g. bridges, buildings, pipelines and etc) while they are in service. Installing sensors on a structure, useful information is acquired which will help us to detect damage scenarios early before they become perilous to the structure. “Smart Structures” that are able to sense any changes in their behavior and environment are introduced by using effective SHM systems. Since the average age of infrastructure in US is more than forty years, this research has gained enormous attention in recent years.

Dr. Azarbajani and his research team are currently working on application of SHM systems on bridges. A steel model truss bridge was constructed for testing the efficiency of the SHM system in early damage detection. Algorithms are developed to extract damage features using wavelet analysis and Fast Fourier Transform. Moreover, damage pattern recognition methods using fuzzy logic pattern recognition technique are investigated.



Nanotechnology Structural Applications and Smart Materials

This research targets the application of nano-fibers to make costly effective fiber reinforced polymers (FRPs) that can be easily applied to any deficient structural member. CFRP sheets have been increasingly used in structural applications as strengthening or retrofitting materials. In particular, due to the ease in application, external FRP sheets have been recognized as an efficient strengthening alternative for existing structures.

