

Still Going Strong: Creating Resilient Infrastructure



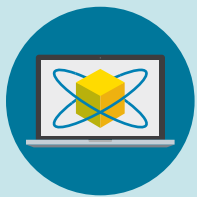
To create resilient infrastructure, civil engineers are tasked with finding ways to minimize risks from

- Aging
- Deterioration
- Climate disasters
- Human-made hazards



Structural health monitoring (SHM) is a growing research area that focuses on performance evaluation to ensure public safety and longer service life of structures

ASCE special collection on SHM



Simulation models

- Reliability analysis
- Damage and condition assessment
- Fatigue evaluation
- Sensor positioning



Novel devices

- SmartSync: An integrated real-time SHM system that is installed in the Burj Khalifa
- Internet of Things fatigue damage sensor that predicts fatigue accumulation using breakable minibeams



Frameworks and methodologies

- Dissipated energy seismic monitoring framework
- Family-of-models approach
- Stochastic structural performance framework



Case studies

- Seismic Retrofitting Project
- Earthquake effects
- Chicago Full-Scale Monitoring Program
- California Strong Motion Instrumentation Program

These studies provide engineers with the theoretical and practical tools to

- Design resilient infrastructure
- Make existing infrastructure safer
- Extend the life of infrastructure
- Find and repair damage



The rapid expansion of SHM will result in infrastructure that is more sustainable and resilient to climate change