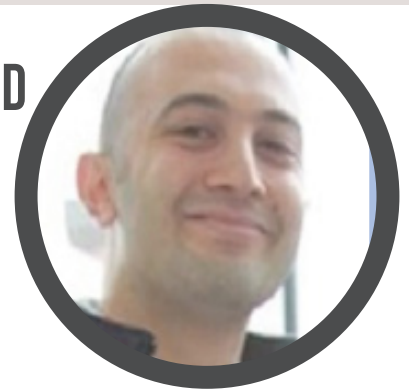


A MOBILE CROWDSOURCING PATH TO SHM-INTEGRATED SEISMIC RELIABILITY ASSESSMENT

Ekin Ozer

Middle East Technical University, Northern Cyprus Campus, Turkey

Despite tremendous rise in sensor and information technologies in the last four decades, structural health monitoring (SHM) discipline remained limited by structure scale applications. Advanced systems, instrumentation, and labour requirements obstructed widespread use of sensor technologies to monitor civil infrastructure. However, advent of smartphones is radically changing sensing notion with ubiquitous devices and citizen participation. Up to date examples show that smartphones can be used for monitoring of structural vibrations and produce valuable decision making tools for infrastructure authorities. This study merges latest advances in smartphone based SHM implementations with a broad perspective. Utilizing smartphone sensors through ordinary citizens, structural vibration data can be acquired at no cost and can be processed to diagnose structural characteristics, e.g. modal parameters. Smart monitoring tools and signal processing techniques can be adopted to eliminate citizen induced uncertainties from crowdsensed vibration data. The identified structural features can be used to calibrate theoretical models and improve accuracy and eventually conduct seismic performance evaluation or reliability assessment with updated models. In summary, from early feasibility tests to necessary crowdsourcing software platforms and from modal identification to model updating, seismic reliability estimation with calibrated models can be done. In this study, a new smart city concept is presented towards better and safer structural systems with modern sensing principles.



Biography

Ekin Ozer, after completing his BSc and MSc from Bogazici University Civil Engineering Department, has completed his PhD from Columbia University, Department of Civil Engineering and Engineering Mechanics. His work constituted the first crowdsourcing examples in vibration-based structural health monitoring field and produced numerous international journal publications scoping sensor technologies and smart structures. After working with Novum Structures specialized in steel and glass components and cladding systems, currently, he is with Middle East Technical University as an Assistant Professor

eo2327@columbia.edu