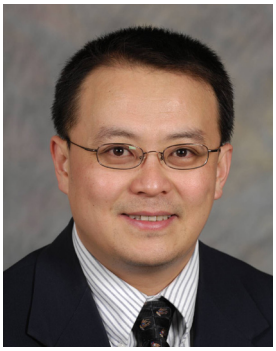
UNIVERSITY TRANSPORTATION CENTER

RESEARCH BRIEF

PROJECT TITLE: **Development of Surface-Mounted Smart Piezoelectric Modules for Bridge Damage Identification and Safety Monitoring**

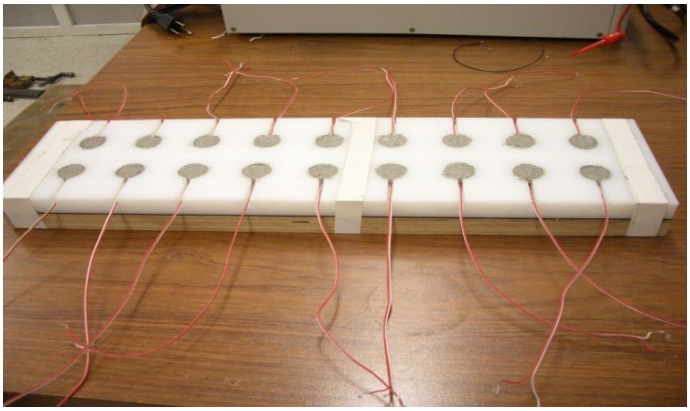
PRINCIPAL INVESTIGATOR: Pizhong Qiao (WSU)

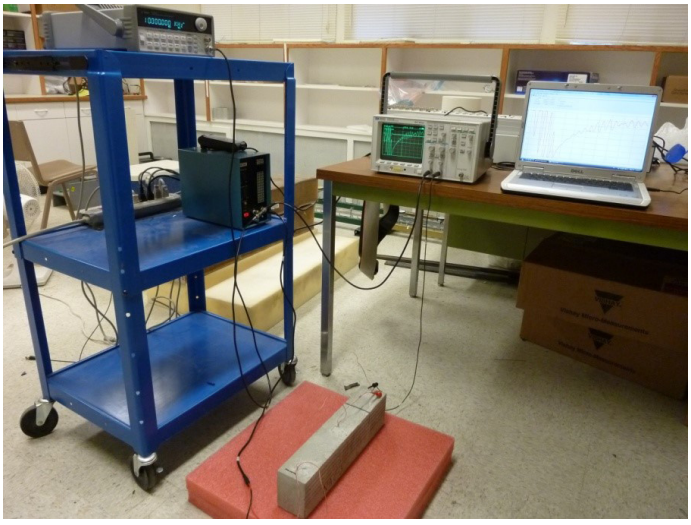
INSTITUTION: SINGLE-INSTITUTION PROJECT
ESTIMATED COMPLETION DATE: JANUARY 2018
SPONSORS: THE PACIFIC NORTHWEST TRANSPORTATION CONSORTIUM, WSU



Background

There is a pressing need to develop an effective safety or health monitoring technique to assess the condition and premature failure of highway bridge structures during their service life and collect useful information and data for bridge repair, maintenance and decision-making so that the economic and human life loss can be avoided. There are many nondestructive methods for inspecting concrete structures, such as radiography, acoustic emission, visual inspection, thermal field, etc.; but the limitations of these techniques, including accuracy, cost, maneuverability, in situ capability, implementation, etc., make them difficult and/or incapable of being applied to in situ and real time structural health monitoring.





Research Project

The objective of the proposed study is to develop an effective non-destructive ultrasonic smart piezoelectric module to be used for identifying the damage and condition (cracks, material degradation, etc.) in highway bridges. Such a smart sensing technology can be used to identify damage in bridge structures, monitor safety conditions, assist bridge maintenance decision-making, help state DOTs perform forensic studies on the bridge premature failure, and meet the PacTrans theme of “developing data driven solutions and decision-making for safe transport”.