Integrated Solutions to SHM Problems: An Overview of SHM Research at the LANL/UCSD Engineering Institute.

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This presentation will summarize various SHM-related research activities ongoing at the Engineering Institute, a research and education collaboration between Los Alamos National Laboratory and The University of California San Diego’s Jacobs School of Engineering. More specifically, these projects attempt to couple new sensor network hardware developments expressly designed for SHM with advanced signal processing, statistical classification and machine learning algorithms for feature extraction and damage assessment. The first part of the presentation will focus on the wireless impedance device (WID-3) sensor node and field demonstration of this system on a highway bridge structure including remote powering of the WID with robotic energy sources. Next the presentation will discuss the SHMTools software that a team of LANL and UCSD graduate students has developed. This software can be tested using standard data sets that are provided to researchers so they can better validate and compare their SHM algorithms. SHMTools was developed to provide researchers with an easy-to-use software tool that can be customized to a particular SHM activity. This software and the validation data sets can be downloaded at no charge from the Engineering Institute’s web site.