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Model update methods for vibration based damage detection in four story book shelf

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In the past, damage detection and structural health monitoring (SHM) in vibration-based methods have been utilized for many case studies. Generally, the methods have been categorized into two main groups such as Finite Element method (Physics-based method) and mathematical method (data-driven method). According to some defects in implementation procedure, the outcomes have not matched with modeling results, therefore the model updating method have been used to correlate the result by applying the stiffness modifier. Basically, model updating problem is an inverse problem, the Physics-based model have mostly non-unique solution. Meanwhile, data-driven models using method such as artificial neural networks (ANN) use the differences in the data patterns in the structural response in order to update the system parameters. In this paper, four story book shelf have been investigated for Ambient Vibration Test (AVT). The structure has instrumented with four wired accelerometers which one of them is placed in each story. There two different model updating techniques which have been considered for this case study such as ANN and Matrix Update Method. The result indicates that Matrix Update Method (Physics based method) is more accurate than ANN (date driven method) in this case study.

Biography

A Sabamehr is studying his PhD under supervision of Dr. Bagchi in Concordia University. He is working on Vibration Base Damage Detection (VBDD). He has passed all of his courses with CGPA 4.3/4.3. He has published more than 10 conferences and 2 conference proceeding journals and is working in one journal in springer to publish soon. During his study, he has been a TA for most of the structure courses.

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