

SLAMBOT: Structural Health Monitoring Robot using Lamb Waves

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Abstract

We propose the combination of a mobile robot and a computational sensor network approach to perform structural health monitoring of structures. The robot is equipped with piezoelectric sensor actuators capable of sending and receiving ultrasound signals, and explores the surface of a structure to be monitored. A computational model of ultrasound propagation through the material is used to define two structural health monitoring methods: (1) a time reversal damage imaging (TRDI) process, and (2) a *damage range sensor (DRS)* (i.e., it provides the range to damaged areas in the structure). The damage in the structure is mapped using the DRS approach.