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RESEARCH ABSTRACT FORM

TITLE: Structural Health Monitoring for Detection of Damages in Mechanical Structures

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Through the use of a cantilever beam mechanism and a strain gauge sensor we are able to test for and calculate variations in strain between normal and damaged structures. The design is able to demonstrate the ability to identify the natural frequency of the cantilever and the change in natural frequency for different loads ranging up to 500g. Due to factors such as decreased surface area or erosion there should be a corresponding decrease or increase in natural frequency values for those structures that are damaged. Using this method we are able to show the variations in natural frequency across different structural materials. This concept can be extended to use in the industrial field where small structural damages in large scale weight bearing machines go undetected until they become very severe and need to be replaced. The cost for replacement of these parts is very high. By implementing these sensors it is possible to do early detection of minor damages allowing for repairs to be made at a lower cost and avoiding the risk of damage to the overall machine.