Abstract

A smart structure cantilever beam is a distributed parameter system that employs sensors and actuators at different finite element locations on the beam and makes use of controllers that respond to inputs obtained from the sensors. The paper uses the mathematical modeling of the smart structure using finite element method and Euler Bernoulli beam assumptions. A state space model of the beam as a Single Input Single Output (SISO) system with two vibratory modes is obtained and the Eigenstructure assignment for linear system with output feedback is studied based on which a controller is designed for two vibratory modes. The effectiveness of the proposed controller is established by the simulation of closed-loop system in MATLAB and
the results show that the controller stabilizes SISO system with a remarkable reduction of settling time of the impulse response.

References

- Moore, B. C. , "On the flexibility offered by state feedback in Multivariable system beyond closed loop eigenvalue assignment", IEEE Transaction on Automatic control, October 1976.
Output Feedback Controller for a Single Input Single Output Smart Structure

Index Terms
Computer Science                Linear Systems

Keywords
Smart Structure                Eigenstructure Assignment                Finite Element Methodology                Output Feedback Controller