

SIMULTANEOUS PERIODIC OUTPUT FEEDBACK CONTROL FOR PIEZOELECTRIC ACTUATED STRUCTURES USING INTERVAL METHODS

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Abstract- In this paper, the problem of modeling, output feedback control design and the experimental implementation for the vibration control of smart cantilever beam with parameter uncertainties represented in interval form is addressed. The interval model of the system is obtained by introducing variation in the parameter of the identified model. However, Uncertainties are assumed in the model, identified through on line recursive least square parameter estimation. The control and identification process is done by using Simulink modeling software and dSPACE DS 1104 controller board. The output feedback controller design for the interval model is carried out through simultaneous output feedback controller design methodology by considering lower, nominal and upper bound models. The controllers designed are periodic output feedback is experimentally evaluated for their performance in suppressing the first vibration mode.

Index terms: Interval analysis, output feedback, piezoelectric, smart structure