عنوان مقاله:

Semi-active Control of Structures Using Neuro-Inverse Model of MR Dampers

محل انتشار:

اولین کنگره مشترک سیستم های فازی و سیستم های هوشمند (سال: 1386)

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خلاصه مقاله:

A semi-active controller-based neural network for nonlinear benchmark structure equipped with a magnetorheological (MR) damper is presented and evaluated. An inverse neural network model (NIMR) is constructed to replicate the inverse dynamics of the MR damper. Linear quadratic Gaussian (LQG) controller is also designed to produce the optimal control force. The LQG controller and the NIMR models are linked to control the structure. The effectiveness of the NIMR is illustrated and verified using simulated response of a full-scale, nonlinear, seismically excited, 3-story benchmark building excited by several historical earthquake records. The semi-active system using the NIMR model is compared to the performance of an active and a clipped optimal control (COC) system, which are based on the same nominal controller as is used in the NIMR damper control algorithm. The results demonstrate that by using the NIMR model, the MR damper force can be commanded to follow closely the desirable optimal control force. The .results also show that the control system is effective, and achieves better performance than active and COC system

کلمات کلیدی:

Structural Control, Semi-active, Neural Network, Nonlinear, MR Damper