

عنوان مقاله:

Semi-active control of vertical vibration of suspension bridges subjected to earthquake, using MR dampers and fuzzy logic

محل انتشار:

هفتمین کنگره ملی مهندسی عمران (سال: 1392)

تعداد صفحات اصل مقاله: 8

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خلاصه مقاله:

In this paper, fuzzy control strategy is presented to enhance the seismic performance of suspension bridges using MR dampers. MR dampers are semi-active control devices that MR fluid used in their structure. They have received significant attention in recent years because of their adaptability of working as active control devices without requiring large power source and also because they can be viewed as fail-safe in that they become passive dampers in lack of the power source. Semi-active control devices require a controller to determine the desired control force. The fuzzy logic is a kind of controller that can directly determine the input voltage of an MR damper from the responses of the structure. In the present paper, Thomas Suspension bridge located in Los Angeles, U.S.A. is chosen as a case study. The responses of the bridge have been studied under application of 15 major worldwide earthquake accelerations. The comparison between the uncontrolled responses and semi-active fuzzy controlled responses indicates that the proposed semi-active control technique can effectively suppress the vertical responses of the suspension bridges.

کلمات کلیدی:

Semi-active control; suspension bridges; MR damper; vertical vibration; fuzzy logic

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