Development of a Brain Emotional Learning based controller for application to vibration control of a building structure under seismic excitation

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ABSTRACT

In this paper, a numerical simulation of a semi-active neuroemotional based control system for vibration reduction of a 3-story framed building structure under seismic excitation is presented. The Brain Emotional Learning Based Intelligent Controller (BELBIC) is used to design a closed-loop control system that determines the required control action (emotional response) based on the desired and actual system response (sensory input). In this case, the control signal is used to adjust in real time the damping force of a MagnetoRheological (MR) damper to reduce the system response. The results obtained from the numerical simulation validate the effectiveness of the brain emotional learning semi-active controller in improving the overall response of the structural system.