

Sakaya Bunchoowit 2012: Study of Vibration Control of A Two-Floored Building Model Based on H_∞ Mixed Sensitivity Controller. Master of Engineering (Mechanical Engineering), Major Field: Mechanical Engineering, Department of Mechanical Engineering.
Thesis Advisor: Mr. Withit Chatlatanagulchai, Ph.D. 102 pages.

At present, house building has been expanding due to increasing demands of growing population. However, with the limitation of space, there emerges the trend of constructing tall buildings in many places. Disturbance deriving from many factors, such as wind or vibration resulting from earthquake may easily cause loss in stability of the structure. Therefore, this research emphasized the design of H_∞ mixed sensitivity controller which mastering the vibration of a two-floored structure model based on H_∞ mixed sensitivity methodologies. The design employed an active mass driver to reduce the vibration of the structure and to make the structure stop vibrating most quickly.

This study aimed to investigate the vibration control of the two-floored structure model. Based on the principle that when the structure vibrates, it will tilt away from the normal position, in which the angle of tilt can be measured by tilt measuring sensor, and then the signal from the sensor will be sent to the designed controller. After that, the controller will pass controlled signal to an active mass driver in order to construct a momentum in the opposite direction of the declining angle. With this, the structure will become less incline or faster erect.

To test the control of disturbance, 0.1-1 Hz. sinusoidal frequency was employed. The study showed that the controller was capable of decreasing vibration size to more than 50% in the frequency range below 0.5 Hz. and the effectiveness of the controller to eliminate the interference declined when the frequency of the noise increased.

Student's signature

Thesis Advisor's signature