Genetic Optimal Design of Passive Vibration Isolation System

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ABSTRACT

Vibration is often resulted from the internal unbalance of rotating components of machine or from the external exciting force. Resonance takes place if the exciting frequency coincided with the natural frequency of system. As system is resonating for a long duration, machine component will be failed in fatigue, shorten in service life, and lost in manufacturing precision or measuring accuracy. Having good accuracy and quality of product, it is necessary to reduce or eliminate the vibration by isolation techniques which is the subject of this research. The main concern in this research focus on technique of passive vibration isolation. It is solved by multi-object optimal problrm via binary genetic algorithm to achieve the parameters of reducer. Two practical cases illustrated are (1) single degree-of-freedom isolation system, and (2) two degree-of-freedom isolation system. Each probem is first to obtained the Pareto ’s solution from GA, then apply it to determine the parameters of reducer.

Keywords : Passive Vibration Isolation ; Genetic Algorithms ; Absorber ; Degree-of-Freedom

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