

ABSTRACT:

This paper examines the effectiveness of a glove specifically designed to compensate human hand tremor by incorporating a type of piezoelectric actuator. In this paper, the experimental results are divided into two parts involving actual human hand tremor and model hand-arm tremor. Both experiments were done using same measurement equipments, experimental setup and programming to evaluate the effectiveness of the glove in reducing the hand tremor. The initial experiment was done by measuring human hand tremor to determine the coherence frequency while other was performed on a hand-arm model with artificial vibration exciter to validate the response of the actual hand tremor. A number of selected sample frequencies were chosen for the experiment. Next, a piezoelectric actuator was employed as the main active element for the compensation of the tremors in both systems. The results presented both in time and frequency domains show that most tremors are readily suppressed to demonstrate the effectiveness of the proposed systems. They are considered as useful data that can be used for further investigation into the technique of effective human hand tremor suppression, particularly applicable to patients suffering from uncontrollable shaking or trembling such as in Parkinson's disease, white hand syndrome, etc. Subsequently, the output of this investigation can be also used to assist in developing advanced control strategies that involve the generation of controlled signals as the input for the piezoelectric actuator or other similar device to suppress the hand tremor. The presented system is notable for simplicity and low cost.