Precision Positioning Control of Gantry Stage Integreted with Pizeo－actuated Stage

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ABSTRACT

The purpose of this paper is to integrate a gantry stage with a PZT actuated stage to achieve precision positioning tasks. The iterative learning control is applied to the gantry stage to achieve the tracking task by the iteration. The learning control is based on the input and output of the error at each step to make the final error minimal. Piezoelectric-actuated stage is modeled by Bouc-Wen model and the parameter identification is using genetic algorithms to solve the LMI optimization problem. After that, the model is applied to design a feedforward controller to eliminate hysteresis effects; besides, a PID feedback controller is added to the control system to compensate to improve positioning accuracy.

Keywords : Iterative learning control、gantry stage、contour tracking、genetic algorithm、hystersis

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