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The Impacts of Weighting Functions on the Robust Performance of a Multi-Axial Piezoelectric Stage

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Abstract

This paper applies robust control strategies to a piezoelectric transducer (PZT) stage, and investigates the influences of weighting functions on the system performance. The designed controllers are implemented for experimental verification, and are shown to significantly improve aspects of the system performance, such as settling time, overshoot, and root-mean-square error. The developed loop-shaping design procedures can be directly applied to general PZT systems.