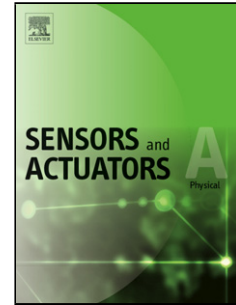


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An adaptive weighted least square support vector regression for hysteresis in piezoelectric actuators

Xuefei Mao^a, Yijun Wang^a, Xiangdong Liu^a, Youguang Guo^b

a. School of Automation, Beijing Institute of Technology, Beijing 100081, China

b. School of Electrical, Mechanical and Mechatronic Systems, University of Technology Sydney, Sydney, NSW 2007, Australia

Highlights

- An adaptive weighted least squares support vector regression (AWLSSVR) is proposed to model the rate-dependent hysteresis of piezoelectric actuators.
- The AWLSSVR hyperparameters are optimized by using particle swarm optimization.
- An adaptive weighting strategy is proposed to eliminate the effects of noises in the training dataset and reduce the sample size at the same time.
- The results show that the AWLSSVR is more accurate than other versions of least squares support vector regression.

Abstract: To overcome the low positioning accuracy of piezoelectric actuators (PZAs) caused by the hysteresis nonlinearity, this paper proposes an adaptive weighted least squares support vector regression (AWLSSVR) to model the rate-dependent hysteresis of PZA. Firstly, the AWLSSVR hyperparameters are optimized by using particle swarm optimization. Then an adaptive weighting strategy is proposed to eliminate the effects of noises in the training dataset and reduce the

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