Self-tuning control of an electro-hydraulic actuator system.

Abstract

Due to time-varying effects in electro-hydraulic actuator (EHA) system parameters, a self-tuning control algorithm using pole placement and recursive identification is presented. A discrete-time model is developed using system identification method to represent the EHA system and residual analysis is used for model validation. A recursive least square (RLS) method with covariance resetting technique is proposed to estimate parameters of the discrete-time model. The results show the proposed control algorithm can adapt the changes occur in model parameters compared with the fixed controller. In conclusion, a self-tuning control is required in improving the EHS system performance in industrial positioning applications.