عنوان مقاله:

Speed control of PM motors using Hybrid Predictive Control Technology

محل انتشار:

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خلاصه مقاله:

Hybrid Predictive Control technology is a type of model predictive control in which both motor and mechanical system takes role in modeling. A discrete-time hybrid model of a permanent magnet synchronous motor (PMSM) with saturation in voltage and current is formulated. The controller design with incorporated constraints is achieved in a systematic way from modeling to control synthesis and implementation. The Hybrid System Description Language is used to obtain a mixed logical dynamical (MLD) model. Based on the MLD model, a model predictive controller is designed for an optimal speed regulation of the motor. For reducing computation complexity and computation time, the MPC controller is converted to its equivalent explicit piecewise affine form by multi-parametric programming. Simulations and experiments show that good and robust control performance is achieved by the hybrid model predictive controller as compared with the linear quadratic regulator (LQR) and the PID controller

کلمات کلیدی:

Mixed logical dynamical; Hybrid MPC; Multi-parametric programming; Model predictive control