Abstract

This paper presents a real time self-tuning controller for DC motor system. Pole-placement adaptive controller based on Exponentially Recursive Least Square (ERLS) algorithm is proposed. The parameters of the DC motor are estimated using ERLS algorithm. Once the estimation error is minimized, the identified parameters are forward to the supervisory control unit to find the corresponding PID gains. A PCI-6251 data acquisition card from National Instrument (NI) and the prototyped control system (33-100 & 33-110) from feedback device are deployed for real time implementation of the proposed solution. Simulation and experimental results verified the effectiveness of the ERLS algorithm, where the parameters of DC motor are estimated rapidly and accurately. Results, also shows the validation of the proposed self-tuning controller for position control of the DC motor system.


Real Time Self-Tuning Controller for Position Control of DC Motor System using Pole-Placement Technique


Index Terms

Computer Science
Artificial Intelligence

Keywords

Real time control, DC Motor, Pole-placement controller, ERLS Algorithm, System identification