Abstract

Increasing the methods of order calculus for Fractional Order Proportional Integral Derivative (FOPID) controller leads to a wide applications for this type of controller in control systems. A closed loop speed control for BrushLess Direct Current (BLDC) motor with FOPID controller runs the motor very close to the reference speed, provides a good performance and robustness compared with a corresponding system using conventional PID controller. In this paper, the BLDC motor is modeled and simulated in Matlab/Simulink for speed control strategy. A DC link speed control strategy is proposed and implemented. The FOPID speed controller parameters (Kp, ki, kd, α, β) are optimized by genetic evolutionary programming module. The effectiveness of the proposed speed control is verified through simulation. The control system is extra tested under a conditions of some motor parameters perturbations. The simulation results reveal a flexible and stable control strategy.

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Index Terms

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Keywords

BLDC motor   modeling and simulation   fractional order PID controller.