Abstract

In this paper, DC motor speed control models were mathematically extracted and implemented using artificial intelligence techniques. Due to multivariable and non-linear in nature, it is difficult to achieve the optimum speed of the motor. Conventional PI controller gives the maximum overshoot problem. To overcome the maximum overshoot, artificial intelligence techniques have been incorporated in the controller architecture. Fuzzy logic controlled model of DC motor is implemented, investigated and further optimised by the genetic algorithm for the optimal fuzzy rule base. Digital signal processor TMS320LF2407A is also tested to control the speed of servo motor. The transient time, steady state response and the performance criteria IAE and ITAE of the above controllers have been investigated. The result shows that the fuzzy logic- GA integrated approach has minimum overshoot, and minimum transient and steady state parameters, which shows the more effectiveness and efficiency of FLC-GA hybridisation than FLC and conventional PI model to control the speed of the motor.
Reference

- Elke Laubwald, “Servo Control Systems: DC servo mechanisms”, citation from control-systems-principles.co.uk.
Design of Embedded Hybrid Fuzzy-GA Control Strategy for Speed Control of DC Motor: A Servo Control Case Study


Index Terms

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