Abstract

This paper proposes the neural network solution to the indirect vector control of three phase induction motor including an adaptive neuro fuzzy controller. The basic equations and elements of the indirect vector control scheme are given. The proposed control scheme is realized by an adaptive neuro-fuzzy controller and two feed forward neural network. The neuro-fuzzy controller incorporates fuzzy logic algorithm with five layer artificial neural network (ANN) structure. The conventional PI controller is replaced by adaptive neuro-fuzzy inference system (ANFIS) which tunes the fuzzy inference system with hybrid learning algorithm. The two feed forward neural network are used as estimator, learned by the Levenberg-Marquardt algorithm with data taken from PI control simulations. The performance of proposed scheme is investigated at different load and speed conditions. The result of the proposed scheme are compared with PI controller. The simulation study indicates the robustness and suitability of drive for high performance drive applications.
Indirect Vector Control of Induction motor using ANN Estimator and ANFIS Controller


Index Terms
Keywords

Adaptive Neuro-Fuzzy Inference System (ANFIS)  Artificial Neural Network (ANN)
Back propagation algorithm

Hybrid learning algorithm

PI controller

Fuzzy logic controller (FLC)