Abstract

This paper describes the comparison of Artificial Intelligence (AI) based rotor position estimation techniques for Switched Reluctance Motor (SRM) with respect to its execution time in Digital Signal Processor (DSP) TMS320F2812. The various networks of Artificial Neural Network (ANN) and Adaptive Neuro Fuzzy Inference System (ANFIS) structures are trained for mapping the nonlinear current-flux linkage-rotor position characteristics of an 8/6 Switched Reluctance Motor. The trained Artificial Neural Network (ANN) models and the Adaptive Neuro Fuzzy Inference System (ANFIS) structures are implemented on DSP TMS320F2812 to estimate the rotor position from the input current and flux linkage. The execution time of the rotor position estimation algorithms based on the Artificial Neural Network (ANN) models and the Adaptive Neuro Fuzzy Inference System (ANFIS) structures are compared. The execution time limits the use of Artificial Intelligence (AI) based rotor position estimation techniques at high speeds. The nonlinear current-flux linkage-rotor position characteristics are obtained from a test motor. It is a special type of Switched Reluctance Motor (SRM) which has a can arrangement in between stator and rotor to enable liquid cooling and also the rotor is not laminated.

Reference

Comparison of AI Based Position Estimation Techniques for Switched Reluctance Motor


Index Terms

Electrical & Electronics

Control Systems
Key words

Artificial neural network (ANN)  adaptive neurofuzzy inference system (ANFIS)
digital signal processor (DSP)
execution time
rotor position estimation
switched reluctance motor (SRM)