Abstract

This paper presents a neural network controller for permanent magnet synchronous motor (PMSM). The neural controller is used for torque ripple minimization of this type of motors. Two methods of neural controller design are used. The first method is based on two loop controllers (current controller and speed controller). The second method is based on estimation of torque constant and stator resistance in PMSM. The q-axis inductance is modeled off-line according to q-axis stator current. The neural weights are initially chosen small randomly and a model reference control algorithm adjusts those weights to give the optimal values. The neural network parameter estimator has been applied to flux linkage torque ripple minimization of the PMSM. Simulation results using the two methods are compared together. Moreover, the suggested algorithms when compared with other controllers show great success in torque ripples.
reduction.

References

- Fernández P, Güemes JA and Iraolagoitia AM. “Speed control of permanent magnet synchronous motors by current vector control”. In: International conference on electrical machines (ICEM); September 2006.


Index Terms

Computer Science Control Systems

Keywords

Neural network PM synchronous motor torque control ripple minimization reference model