

Neural network-based adaptive control for induction motors

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Description

Neural network-based adaptive control scheme is developed to address the tracking problem of an induction motor (DVI) based on a modified version of field oriented control (FOC). In this paper, conventional PI controller is applied to regulate the speed and torque in the synchronous rotating coordinates. However, PI is simple but sensitive to parameter variations. Taking advantage of this fact, we aim to develop an adaptive control methodology that provides strong robustness to parameters variations, unmodelled dynamics and disturbance rejection. The obtained controller is then augmented by an online single hidden layer neural network (SHL NN) that is used to adaptively compensate for the partially known dynamics and unknown or varying system parameters. The network weights are adapted using a Lyapunov-based design. The effectiveness of the proposed controller is demonstrated through computer ...