

Feedback linearisation control of an induction machine augmented by single-hidden layer neural networks

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Description

We consider adaptive output feedback control methodology of highly uncertain nonlinear systems with both parametric uncertainties and unmodelled dynamics. The approach is also applicable to systems of unknown, but bounded dimension. However, the relative degree of the regulated output is assumed to be known. This new control strategy is proposed to address the tracking problem of an induction motor based on a modified field-oriented control method. The obtained controller is then augmented by an online neural network that serves as an approximator for the neglected dynamics and modelling errors. The network weight adaptation rule is derived from the Lyapunov stability analysis, that guarantees boundedness of all the error signals of the closed-loop system. Computer simulations of an output feedback controlled induction machine, augmented via single-hidden-layer neural networks, demonstrate the ...