

基于RBF神经网络的混合输入机构自适应控制 Adaptive Control of Hybrid Machine Based on RBF Neural Network

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关键词: 混合输入机构 径向基函数神经网络 自适应控制 轨迹跟踪

摘要: 提出一种伺服电动机对常速电动机运动进行闭环跟踪的控制策略, 控制伺服电动机的运动, 以实现对方速电动机速度波动的补偿。由于系统精确模型难以获得, 设计了基于名义模型的径向基函数网络自适应控制器, 进行混合输入机构轨迹的跟踪, 应用径向基函数(RBF)神经网络对系统中摩擦、外部扰动和动力耦合等不确定因素的和进行逼近, 网络输出权值由自适应算法学习确定, 并对该控制器进行稳定性分析。仿真结果表明, 所设计的控制器稳定有效, 具有较强的鲁棒性。The precision of trajectory tracking of hybrid machine was debased because of velocity fluctuation in constant velocity motor and uncertainties in the system. The strategy for control servo motor grounded on tracking the motion was proposed, to compensate the velocity fluctuation of constant velocity motor. Considering the uncertainties of the system, an adaptive sliding mode controller based on RBF neural network was designed for trajectory tracking of hybrid machine. The sum of uncertainties of the system was compensated by control gain with RBF neural network, and the output weight of in network was adjusted by adaptive algorithm. The simulation result indicated the robustness and effectiveness of the controller.

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