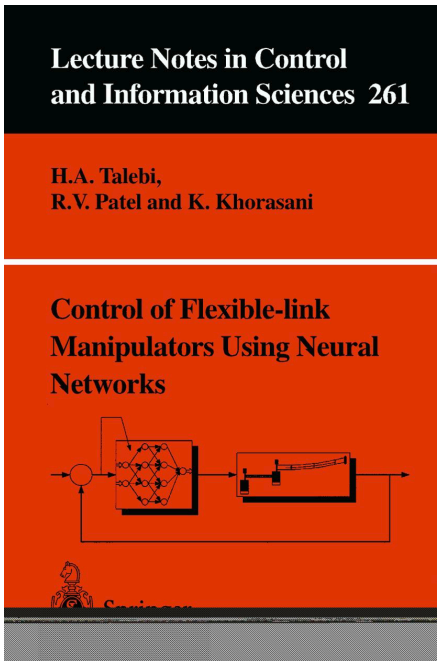


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# Control of Flexible-link Manipulators Using Neural Networks

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Control of Flexible-link Manipulators Using Neural Networks addresses the difficulties that arise in controlling the end-point of a manipulator that has a significant amount of structural flexibility in its links. The non-minimum phase characteristic, coupling effects, nonlinearities, parameter variations and unmodeled dynamics in such a manipulator all contribute to these difficulties. Control strategies that ignore these uncertainties and nonlinearities generally fail to provide satisfactory closed-loop performance. This monograph develops and experimentally evaluates several intelligent (neural network based) control techniques to address the problem of controlling the end-point of flexible-link manipulators in the presence of all the aforementioned difficulties. To highlight the main issues, a very flexible-link manipulator whose hub exhibits a considerable amount of friction is considered for the experimental work. Four different neural network schemes are proposed and implemented on the experimental test-bed. The neural networks are trained and employed as online controllers.

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