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Observer-based Versus Non-observer Based Adaptive Control of Electrically Driven Cooperative Manipulators Using q-analogue of the Bernstein-Schurer-Stancu Operator as ...

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Description In this paper, the q-analogue of the Bernstein-Schurer-Stancu operator is proposed for uncertainty approximation in adaptive control of cooperative electrically driven manipulators. Thanks to the simplicity of the q-analogue of the Bernstein-Schurer-Stancu operator in comparison with other alternatives, the number of signals needed in the construction of the regressor vector for uncertainty approximation is reduced considerably. Studying the accuracy of model-free observers on cooperative robot manipulators is one of the motivations of this paper. Therefore, it is assumed that velocity signals are unavailable, and an observer is needed to estimate these signals. The results are also compared with the case in which velocity signals are in hand. According to the simulation result, the proposed observer can produce results that are very close to the point in which the velocity signal is used in the control law.

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