Control of Triple Link Inverted Pendulum on Two-Wheeled System Using IT2FLC

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Abstract

A triple link inverted pendulum is dynamic and highly unstable system. In this paper, an intense comparison is demonstrated in order to stabilize triple link inverted pendulum on two wheels system based on fuzzy logic controls. The model of triple link inverted pendulum on wheels is developed using SimWise 4D CAD software environment and the model is integrated with Matlab/Simulink for control purpose. Each link is controlled by fuzzy controller to maintain in the upright position on two wheel system. The performance of each links is observed in terms of peak undershoot, peak overshoot, settling angle, and steady state angle. The result shows that Interval Type-2 fuzzy logic control (IT2FLC) is superior and give better performance compared to Type-1 fuzzy logic control (T1FLC).

Keywords—Triple link inverted pendulum, Type-1 Fuzzy logic control, Interval Type-2 Fuzzy logic control

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