Research of System Design and Stability Control Experiments of Riderless Bicycle

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ABSTRACT

This thesis is focused on designing and realizing the balancing control system of a riderless bicycle. The control system of the riderless bicycle is based on the steering control system and speed control system that are implemented by an industrial personal computer (IPC) and a fuzzy controller. A data measurement system for riding condition of the bicycle is developed, including the measuring the roll angle of the bicycle, the steering angle of the front fork, and the bike speed. These data are provided to the controller implementing the calculation. At last, the steering control system driven by a servomotor is designed to simulate the steering control of the rider. The data acquisition program and the control program used are written by LabVIEW. The experimental data are used to show the feasibility of the proposed system and controller.

Keywords : Riderless Bicycle ; Fuzzy Control ; IPC

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