Experimental Study on the Stability of Uncontrolled Two-Wheel Vehicles

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ABSTRACT

This study shows numerous experimental results which focus on answering the question: “ If we have several two-wheel vehicles, by experimental method, how can we judge which one is more stable? ” Some oscillation modes concerning two-wheel vehicles can become unstable for a given vehicle speed: capsize mode, wobble mode, and weave mode. In our work, bicycles are used to develop the stability of two-wheel vehicles. A testing system is developed with appropriate sensors for measuring steering angle, vehicle roll, yaw angle, and forward speed. LabVIEW with non-linear curve fitting function is the tool of choice for data acquisition and data analysis. This system is used to judge the stability of bicycles. In this study, we accomplish experiments on different bicycles. The measurement results of these bicycle are compared together to figure out which one is more stable. Moreover, we also run the theoretical bicycle model to validate experimental results.

Keywords : Bicycle Dynamics, Bicycle Stability, Bicycle Experimental Measurement, Curve fitting function

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