Automatic Brake System for Motorcycle

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This research presents a prototype of automatic brake system for motorcycle. We chose Laser Distance Meter as the rangefinder because it has high accuracy (1 mm), and stepper motor as the actuator because its torque (0.47 N·m) enables to control brake mechanism easily. Those components were assembled, programmed, and acts as the basis of brake operation command. The simulation result shows that the programming system was synchronous to the Laser Distance Meter, stepper motor mechanism, and brake mechanism. In range 11.11 m/s (40 km/h) – 30.56 m/s (110 km/h) using “3 seconds to brake" principle, we obtained prototype velocity ratio is 0.70 – 0.76 and prototype deceleration is 1.11 m/(s^2) – 2.41 m/(s^2). Both prototype velocity ratio and prototype deceleration do not exceed the limit based on stopping distance data analysis, it indicates that automatic brake system for motorcycle is said to be safe for riders. Using stopping distance data analysis, we obtained prototype percentage of deceleration ratio is 51% - 74% on dry roads and 44% - 58% on wet roads. Those percentages show that automatic brake system does not take over the motorcycle regular brake system (riders can brake manually). Keyword: automatic brake system, motorcycle, Laser Distance Meter, motor stepper.

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