A Self-Balancing System for Two Wheeled Vehicles

Balanced Innovations Inc.

**PROJECT SUMMARY**

Balanced Innovations was tasked to develop a stabilization device which was able to balance a two wheeled vehicle at low speeds. Previously, a continuously revolving gyroscope was employed. For this employed after comprehensive and careful analysis, gyroscope system was replaced by an inverted pendulum approach.

The ability to stabilize a two wheel vehicle without human interference would allow for a completely enclosed motorcycle which would allow for climate control of the cabin. This would let people ride bikes in any weather. Stabilization of this type would also provide a platform for handicapped people to be able to enjoy motorcycles. In addition, most people commute to work on their own. Their driving large cars with 5 or more seats wastes fossil fuels by carrying around unnecessary weight. A fully enclosed motorcycle with the ability to balance itself could lend itself to commuters with its ability to balance and steer like a car but to park like a motorcycle.

**TECHNICAL APPROACH**

The self-stabilization system utilizes the concepts of rotational inertia by creation of torques and counter torques generated by the flywheel to resist the toppling of the two wheeled vehicle between speeds of 0 to 5 miles per hour. The system analyzes the lean angle of the vehicle by employing a accelerometer. That data was sent to a microcontroller that determined the torque necessary to balance the vehicle. This torque was generated by a DC motor that applied the torque on a flywheel and the reaction torque balanced the system.