Efficiency Developement of Air Boat Model Movement Using Angular Velocity Measure

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It can be foreseen that the future vehicles will include more computerized control and navigation system. It is also expected that these future vehicles will travel with much greater speed. Better and more precise vehicle control system is therefore needed. This project focused on the stable navigation aspect of vehicle using a PID (proportional, integral and derivative) controller. The project also involved the design, construction and optimization of several moderate to high speed air boat models in order to be paired with the control system for testing purposes. The motivation of our project is to give drivers better control and help them avoid accidents by automatically compensating the steering when perturbation, due to uneven terrain, happens. The goal of our design is to build a working prototype that could be later implemented on a full size vehicle. The basic approach of this design differs from existing technology because it utilizes rate gyro sensors and stabilizes a vehicle by calculating actual versus target angular velocities that the body of the air boat should be undergoing. If there is a difference in the target versus measured, the speeds of dual motor-driven propellers are automatically compensated. One common challenge in developing a control system is accounting for dead time which is the time elapsed between when a driver issues a command and when the system achieve the target point. As the dead time increases, driving becomes more difficult. As the driver may not have accurate information on the execution status, driver may make incorrect decisions and continue to steer when the previous steering commands may have been sufficient. The control of vehicle at high speeds introduces more challenges since a much greater distance would have been trave

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