Ball Balancing System

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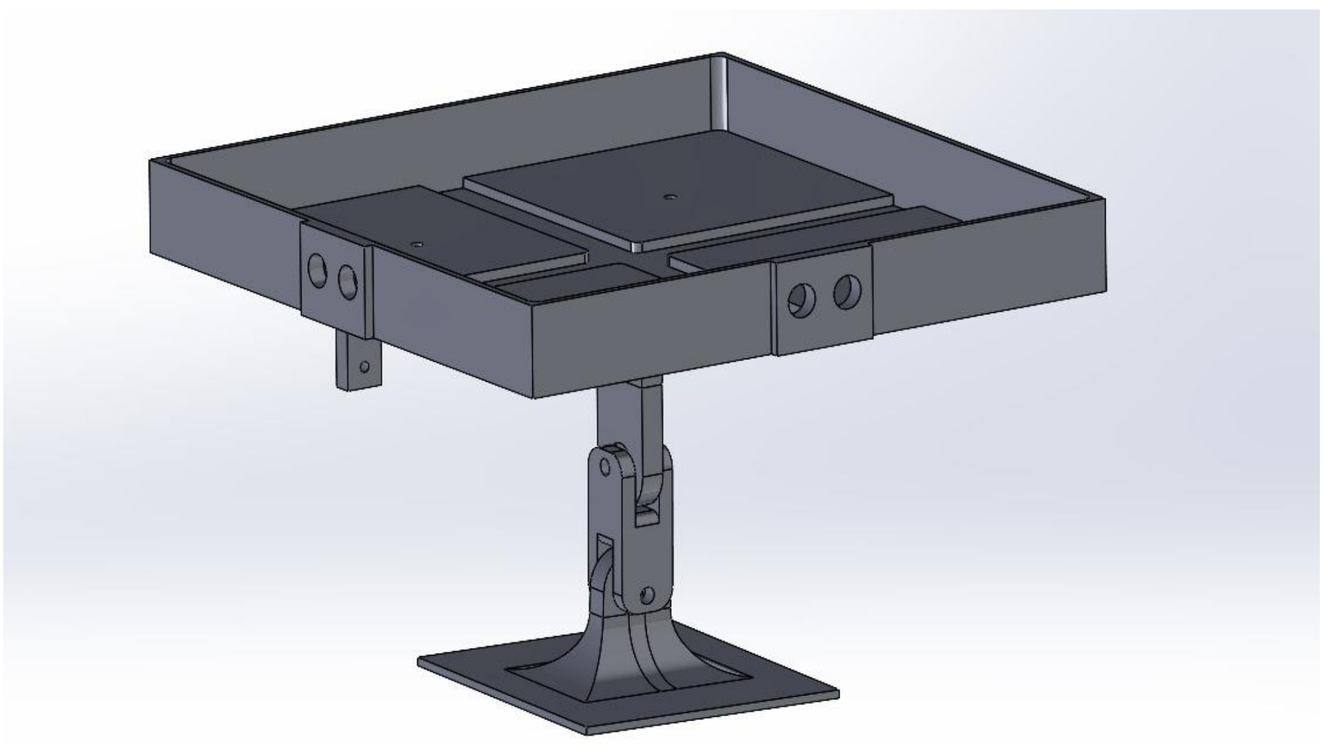
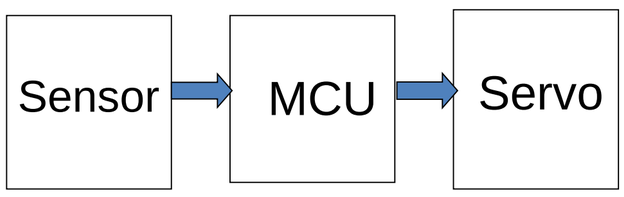
Abstract

This report introduces an advanced Ball Balancing System that integrates sophisticated control algorithms and sensory feedback mechanisms to address the increasing demands in robotics and automation. The system employs a Proportional-Integral-Derivative (PID) control algorithm and machine learning techniques to ensure the stability of a spherical object on a dynamic platform. Demonstrating adaptability across diverse conditions, the innovative system holds potential applications spanning from industrial automation to entertainment and educational robotics.

Mechanical Drawing



Flow Chart

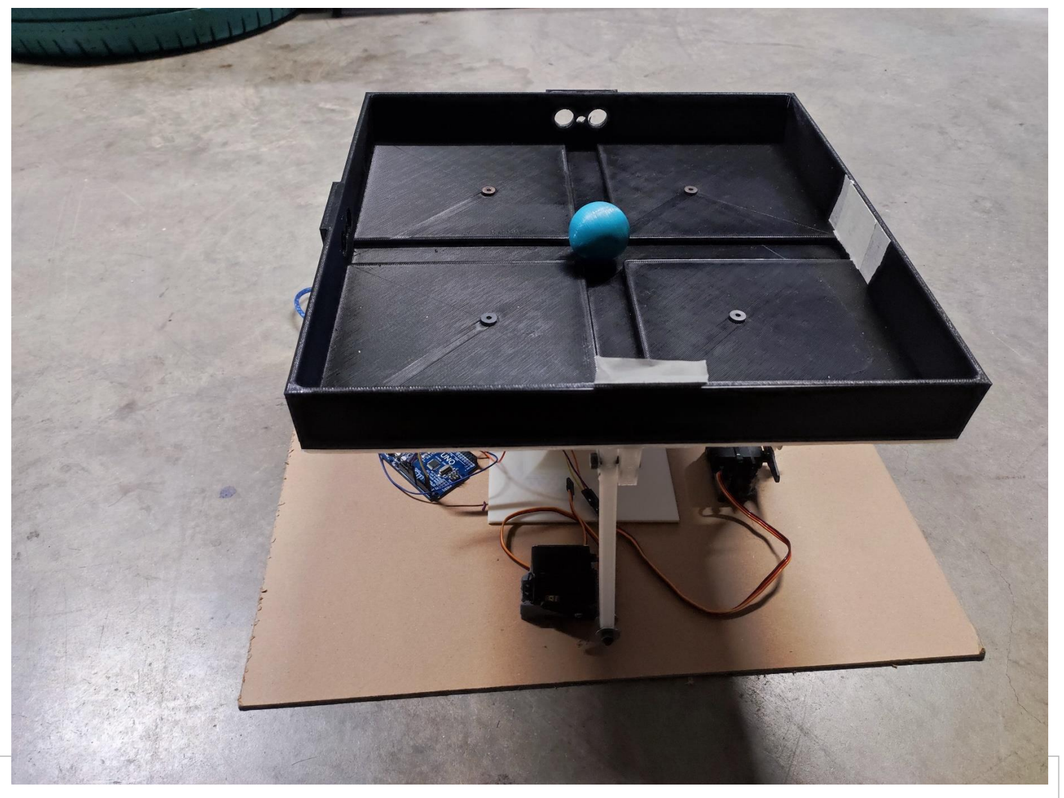


Main Components

Servo motor, ultrasonic sensor, microcontroller, plate.

Main board

Lidar sensors are placed on 2 axes to determine the position of the ball. The information from the sensors is transferred to the Arduino. It is processed in the Arduino and tried to balance the ball in the middle of the plate changing the angle of plate by means of the motors.



Conclusion

With the help of its quick response mechanisms and high-precision sensors, the ball balancing system successfully maintains the ball's equilibrium, exhibiting good performance in a variety of application areas. This system offers notable benefits in terms of control and stability, making it an effective solution for the entertainment, educational, and industrial sectors.

References:

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