Balancing Robot

The goal of this project is to create a robot that can balance on “legs”. The physical design was made in SolidWorks and I am currently on the 1st iteration. The robot is roughly 0.5 m tall and weights 3 kg. The design was made to be 3D printed on my Ender V2.

The robot uses a, 9 DOF, IMU that communicates with an Arduino Uno. The Arduino controls the 4 servo motors, that control the position of each joint. A reverse kinematic model is used to control the Robots legs positions. The robot has the ability to lean left/right/backward/forward and crouch/extend its legs. The Arduino is also connected to brushed servo motors that control the speed and direction of the wheels.

The system will use PID control loops to activity balance the robot. The Arduino also reads a PWM signal from a radio transmitter which will allow for the user to drive the robot around.

I have made the existing robot CODE and CAD available on my GitHub.