

README

In this project, we have developed a 2-wheeled self balancing robot. In order to balance the bot, the magnitude and direction in which the bot is tilting is measured using **accelerometer** and **gyroscope**. The signals obtained are then used to move the wheels in the direction in which the bot is falling. **Complementary filter** is used to obtain better results from the accelerometer and gyroscope. Initially the **Linear Quadratic Regulator (LQR)** controller was used to control the Bot, but there were some complications with respect to the physical limitations of the Bot. Then we switched to **Cascaded Proportional Derivative (PD) controller**. Here, Cascaded Proportional Derivative (PD) is used to control the **motor speed**.

1. The **CAD** folder contains the 2D CAD drawing of the chassis
2. The **code** folder contains the code written in C++ in Arduino IDE
3. The **datasheets** folder contains the documentation of the hardware components used
4. The **demo** folder contains the youtube link for the demo video
5. The **presentation** folder contains the presentation PPT material
6. The **reference_papers** folder contains research papers that were referred for the project
7. The **report** folder contains the detailed report of the project
8. The **resources** folder contains a list of sites/webpages that were referred for the project