Balance principle of car

The tutorial briefly introduces the balance principle of the balance car.

Balance example

We can understand the balance principle by putting a wooden stick on the fingertips to keep the stick upright.

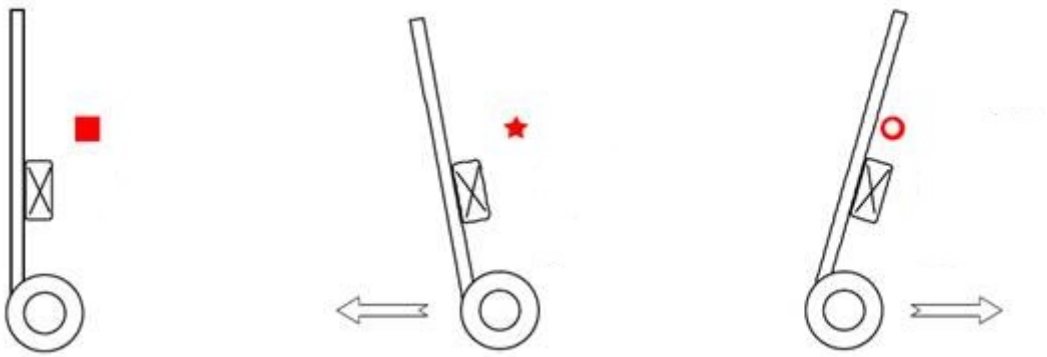
In the whole process, the condition for us to keep the wooden stick upright is: negative feedback control

1. Observe the tilt angle and tilt trend (angular velocity) of the wooden stick with your eyes → equivalent to the MPU6050 of the car
2. Use the movement of your fingers to offset the tilt angle and trend of the wooden stick, so that the wooden stick can stand upright → equivalent to the motor of the car

Our balance car also achieves balance through negative feedback control!

Balance of balance car

If we need to balance the car, we only need to control the rotation of the motor to offset the tilt trend in one dimension to keep the car balanced.



So according to the above principle, the inclination of the car is eliminated by measuring the inclination angle and inclination speed of the car and controlling the acceleration of the car wheels.

Therefore, the measurement of the inclination angle and inclination speed of the car becomes the key to controlling the uprightness of the car.