1.1 building block balance car balance principle

The main reason why the building block balance car can keep balance is its low center of gravity. Most of the weight of the vehicle body comes from Super:bit, and the entire Super:bit is below the center axis of the wheel. Because of the earth's gravity and ground support, the heavier side of the balance car will remain in the lower half. It can maintain self-balancing without being subjected to other external forces, and can maintain a balanced standing state even if it is not powered.

When the motor is running, it will change the state of the building block balance car. However, due to the inertia, when the motor starts at the maximum speed, the Super:bit at the bottom will also oscillate at a certain angle, causing obvious shaking and returning to normal operation after a period of time. We can start the car with a speed that accelerates from low to high, so that the car can start smoothly and avoid Super:bit shaking.

When stopping, the building block balance car will also shake due to inertia, so we can choose to stop the car evenly when stopping, but this will extend the time of the car stop, and even if the car stops, it will move forward. It’s obviously not a good idea to stop at a distance.
However, we can use the accelerometer chip on the micro:bit board to detect the pitch angle when stopping (the accelerometer angle is 90 degrees when the state is stopped). If the angle is too large or too small, let the car adjust itself in time. The location to reduce sloshing.

Side view of the building block balance car: