

TILT TRACKER

Project Description The **Tilt Tracker** is an interactive project that uses an MPU6050 accelerometer sensor and an OLED display to control a digital ball. When the user tilts the physical board, the ball on the screen moves in that same direction.

How it Works

- **Data Collection:** The MPU6050 sensor continuously reads the physical acceleration across three axes (X, Y, and Z).
- **Filtering:** The raw sensor data is run through a low-pass filter to reduce noise and stabilize the readings.
- **Calculating Position:** The filtered data is used to calculate the board's tilt angles (roll and pitch). These angles are multiplied by a scaling/sensitivity factor to determine the target X and Y coordinates on the 128x64 OLED screen.
- **Smoothing & Boundaries:** A smoothing formula is applied so the ball glides fluidly toward its target rather than jumping erratically. The code also checks the ball's position to ensure it doesn't roll off the edges of the screen.
- **Display Update:** The main loop rapidly clears the OLED screen and redraws the ball at its newly calculated position every 10 milliseconds, creating the illusion of smooth motion.