

Element	Definition
Battery	A device to power an arduino board. Ensure the stability and continuity of power supply voltage; ensure the function of arduino board (5V output and serial port); ensure that the arduino board will not overheat or damage. The Arduino board can be powered by USB-A connection to the USB interface of the laptop, or by a 7-12V external power supply. We use: 9V external power supply.
Accelerometer (MPU-6050)	We use the triple-axis MEMS accelerometer in the mpu-6050 to determine the motion of our Arduino board. The accelerometer is powered by a 5V output interface from the arduino, and the data is transmitted to the arduino through SCL and SDA (both pins are part of the I2C serial bus). Here we use the MPU 6050 to detect the X-axis data, which helps us determine the direction of movement , so that the correct direction of the letter can be output by our LED.
Arduino microcontroller	The Arduino board is powered by a 9V external power supply. Its main function is to control the output of LED. We use seven leds, which constitute a display resolution of 5 * 7 (width, length) to display POV. The microcontroller imports data from the accelerometer to determine the current movement direction of the arduino board, and lights the LED in a different order to display a visual seven letter word from left to right.
LED display	7 leds are connected to the 3-9 pin of Arduino interface and receive digitalwrite signals (high 5V or low 0V). They will flash at least 20 frames per second for POV viewing. The display delay we used is 0.02s, which meets the requirements.
Environment	Display in a dark enough environment to ensure better results. Standard lux at night is around 150-250, and we make sure to test under 300 lux.