

Subroutines

Self-test subroutine

//While ADXL is stationary

Function ADXLSelfTest(ST_pin, X_pin, Y_pin, Z_pin) {

Write digital low to ST_pin

Pause 100ms

Record base values from X_pin, Y_pin, Z_pin

Write digital high to ST_pin

Pause 100ms

Record new values from X_pin, Y_pin, Z_pin

Write digital low to ST_pin

Calculate difference between base values and new values

If difference is greater than 0.3V (ADC value $4096 * 0.3/3.3 = 370$) {

Output to serial "Self-test passed"

Return true

}

Else {

Output to serial "Self-test not passed"

Return false

}

}

Calibration subroutine

//After step tracker is mounted on the shoulder

Function ADXLCalibration(X_pin, Y_pin, Z_pin) {

Pause 5s

Record base values from X_pin, Y_pin, Z_pin

Pause 5s

Blink LEDs to indicate that user should start walking

//While user is walking

For the next 10s {

Record maximum values from X_pin, Y_pin, Z_pin

}

Blink LEDs twice to indicate that calibration is complete

Subtract base values from maximum values to get differences

Divide difference values by 1.4

Return an array of base values and difference values

//These values should be used in the main script for comparison to detect steps

Step tracker subroutine

//After calibration is complete

Function stepTracking()