PROJECT DETAILS

"Calorie and Step Tracking System"

This project aims to create a system which is capable of tracking steps while walking, taking HR measurements and using the data gathered to calculate an estimate of burned calories.
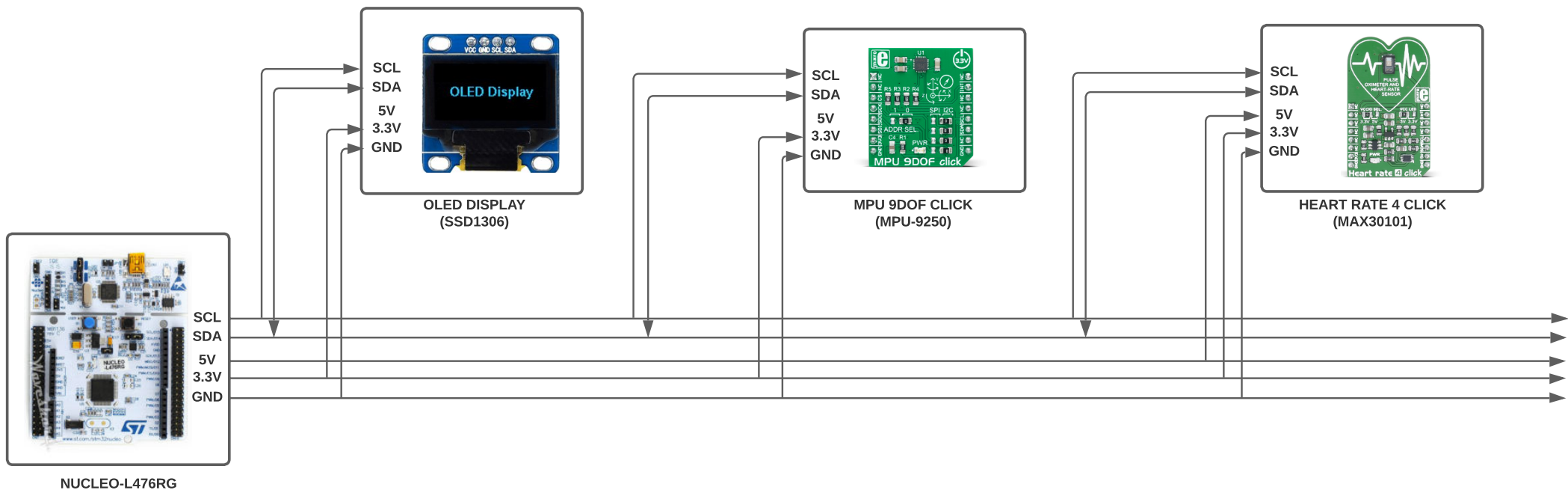
To achive this, the system is comprised of the following components:
- **STM32L476RG** Microcontroller
- **MPU 9DOF Click** carrying a *MPU-9250* System in Package
- **Heart Rate 4 Click** carrying the *MAX30101* high-sensitivity pulse oximiter and heart-rate sensor
- **OLED Display** (*SSD1306*)

The information displayed on the OLED Display during operation include:
- *Elapsed Time*
- *Steps*
- *Average Heart Rate*
- *Calories Burned*

SYSTEM BLOCK DIAGRAM

OLED DISPLAY
(SSD1306)

SCL
SDA
5V
3.3V
GND

MPU 9DOF CLICK
(MPU-9250)

SCL
SDA
5V
3.3V
GND

HEART RATE 4 CLICK
(MAX30101)

SCL
SDA
5V
3.3V
GND

NUCLEO-L476RG

SCL
SDA
5V
3.3V
GND

SYSTEM FLOW DIAGRAM

START

PARAMETER
INIT

MCU INIT

MPU-9250
INIT

MPU-9250
CONFIG

ACCELL
CALIBRATION

MAX30101
INIT
CLEAR
RESET

MAX30101
CONFIG

1

1

SSD1306
INIT

loop

ACCELL
READ

**if ((X^2 + Y^2 + Z^2) > THRESHOLD^2)
STEPS = STEPS + 1**

MAX30101
READ
FILTER

**Read IR Value
Remove DC
Filter IR Value**

DETECT
PULSE
CALC

ABPM = PULSE_COUNT/TIME

**CALORIES = (0.4472*ABPM - 0.05741*WEIGHT +
0.074*AGE - 20.4022)*TIME/4.184**

SSD1306
WRITE

**>> TIME
>> STEPS
>> ABPM
>> CALORIES**

TOGGLE LED
DELAY 100ms