**Hardware component development:**

Wearable Sensor:

* [Adafruit AS7262](https://learn.adafruit.com/adafruit-as7262-6-channel-visible-light-sensor)
* Arduino Micro (for size and power consumption purposes)
* SD Card Module
* 9V battery

Stationary Sensor:

* Raspberry Pi
* [Adafruit AS7262](https://learn.adafruit.com/adafruit-as7262-6-channel-visible-light-sensor)

**Software:**

[Github Repo](https://github.com/cqvu/as7262)

Wearable Sensor Arduino code:

#include <Wire.h>

#include <SPI.h>

#include <SD.h>

#include <TimeLib.h>

//#include <LowPower.h>

#include "Adafruit\_AS726x.h"

const int chipSelect = 4;

const unsigned long READ\_PERIOD = 60000; //1 minute

unsigned long time\_now = 0;

unsigned long elapsed\_time = 0;

//create the object

Adafruit\_AS726x ams;

//buffer to hold raw values

uint16\_t sensorValues[AS726x\_NUM\_CHANNELS];

void setup() {

Serial.begin(9600);

Serial.println("Begin!");

// initialize digital pin LED\_BUILTIN as an output.

pinMode(LED\_BUILTIN, OUTPUT);

//begin and make sure we can talk to the sensor

if(!ams.begin()){

Serial.println("could not connect to sensor! Please check your wiring.");

while(1);

}

Serial.print("Initializing SD card...");

// see if the card is present and can be initialized:

while (!SD.begin(chipSelect)) {

Serial.println("Card failed, or not present");

// don't do anything more:

digitalWrite(LED\_BUILTIN, HIGH);

delay(1);

digitalWrite(LED\_BUILTIN, LOW);

}

Serial.println("card initialized.");

}

void loop() {

time\_now = millis();

//ams.drvOn(); //uncomment this if you want to use the driver LED for readings

ams.startMeasurement(); //begin a measurement

//wait till data is available

bool rdy = false;

while(!rdy){

//LowPower.powerDown(SLEEP\_500MS, ADC\_OFF, BOD\_OFF);

delay(5);

rdy = ams.dataReady();

}

//read the values

ams.readRawValues(sensorValues);

/\*

Serial.print(" Violet: "); Serial.print(sensorValues[AS726x\_VIOLET]);

Serial.print(" Blue: "); S erial.print(sensorValues[AS726x\_BLUE]);

Serial.print(" Green: "); Serial.print(sensorValues[AS726x\_GREEN]);

Serial.print(" Yellow: "); Serial.print(sensorValues[AS726x\_YELLOW]);

Serial.print(" Orange: "); Serial.print(sensorValues[AS726x\_ORANGE]);

Serial.print(" Red: "); Serial.print(sensorValues[AS726x\_RED]);

Serial.println();

Serial.println();

\*/

digitalWrite(LED\_BUILTIN, LOW);

time\_t timeStamp = now();

String dataString = String(timeStamp) + "," + String(sensorValues[AS726x\_VIOLET]) + "," + String(sensorValues[AS726x\_BLUE]) + "," + String(sensorValues[AS726x\_GREEN]) + + "," + String(sensorValues[AS726x\_YELLOW]) + + "," +String(sensorValues[AS726x\_ORANGE]) + "," + String(sensorValues[AS726x\_RED]);

File dataFile = SD.open("data.txt", FILE\_WRITE);

// if the file is available, write to it:

if (dataFile) {

dataFile.println(dataString);

dataFile.close();

// print to the serial port too:

Serial.println(dataString);

}

// if the file isn't open, pop up an error:

else {

Serial.println("error opening datalog.txt");

}

// set consistent sampling rate

while( millis() < time\_now + READ\_PERIOD) {

//LowPower.powerDown(SLEEP\_500MS, ADC\_OFF, BOD\_OFF);

}

digitalWrite(LED\_BUILTIN, HIGH);

}

Stationary Raspberry Pi Code:

* [Code](https://github.com/cqvu/as7262/blob/master/as726x_simpletest.py)
* Google Sheets API, [Google Script](https://script.google.com/a/ucsd.edu/d/17b80r-2fjx6uhjNh8dYVkKwaApt1iatI9GVzI9JhiEO4Dda-EHk_ex6h/edit?usp=drive_web), PushingBox to post readings to [this Google Sheet](https://docs.google.com/spreadsheets/d/1a2zb5rGkZf21K3Y75TSlwKAPjoVbYT5QcgH4OA1YRCk/edit)
  + PushingBox allows us to send HTTP (GET/POST) requests and the Google Script updates the Google Sheets with the data sent through PushingBox
* The data is also recorded in a local file within the RPi just in case internet connection fails or PushingBox reaches daily limits