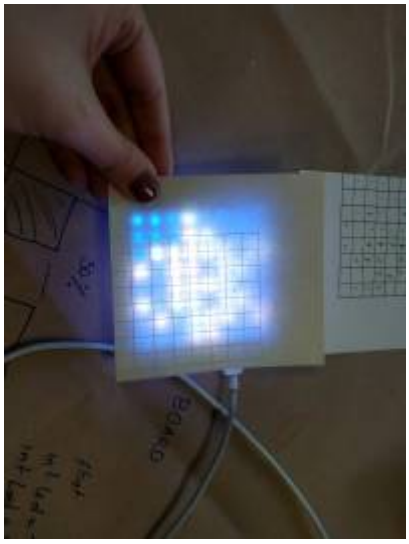
El taller



talleretsbibliosanjavier.mp4

Videos

Sesión 1

- concierto solenoide: https://www.youtube.com/watch?v=g_hiz-Kx0kM&list=PL341E603FB13FE2D3&ab_channel=reduzent
- Processing & Kinect Sensor: Finger Tracking + OSCP5 + Pure Data + Arp2600 https://www.youtube.com/watch?v=X5WGyJPS_5s

- Experimento de resonancia acustica: https://www.youtube.com/watch?v=wvJAgrUBF4w&ab_channel=brusspup
- Graffiti Laser: http://www.graffitiresearchlab.com/blog/projects/laser-tag/
- Delicate boundaries: http://csugrue.com/delicateboundaries/
- Licuadora que funciona con gruñidos:https://youtu.be/6DDkwdPaYmk
- Almacenador de gritos: https://youtu.be/Ta7rN5TeKzw
- Drawdio: https://www.youtube.com/watch?v=Ein9asQgfB8 y https://www.youtube.com/watch?v=HYg8iycYZNs&t=2s
- sensor pez: https://twitter.com/unloquer/status/1099095464291508224
- planta feliz: https://www.youtube.com/shorts/YAsNIonSBac
- juego de cubos en una caja :https://www.youtube.com/shorts/YZ7aAG4DWZk
- pelotica:https://www.youtube.com/shorts/9eLff37aS4U
- pez automata:https://youtu.be/HH9lDf5W-gU
- concierto de 8bits: https://youtu.be/nE3JVpOwWuU
- Lista de reproduccion: https://www.youtube.com/playlist?list=PL36dJutVa9QZj95urcHqORXl1mH-VnsEN
- galería de algunos sensores:https://twitter.com/jero98772/status/1383031921484165120
- multimedia de jugetes: https://wiki.unloquer.org/personas/jero98772/taller_explora/multimedia
- Taller de aire y vestuario: https://www.flickr.com/photos/37012247@N06/49257858968/

Sesión 2

Para generar ideas:

Sensores de calidad del aire y weareables: https://youtu.be/8ZFxrDkVOFk

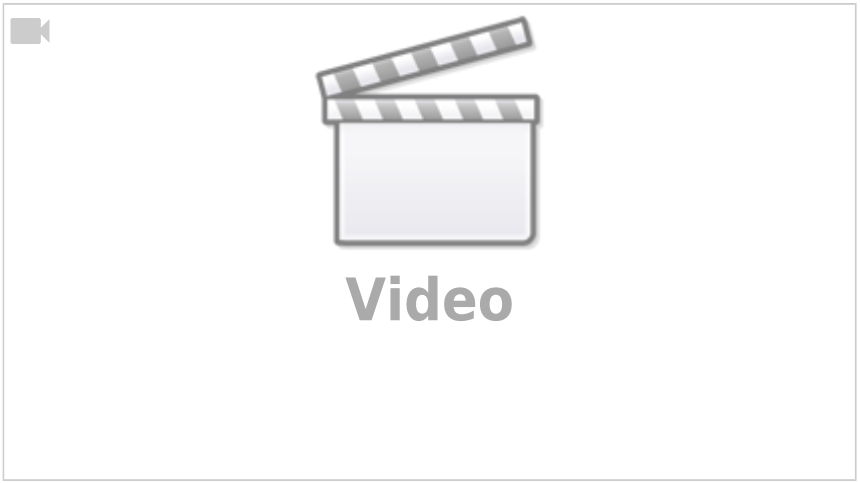
Fanzine con manual de instalación

sin_titulo.pdf

Sesión 3

Para crear los conceptos:

Comprender el mundo a través de los datos:



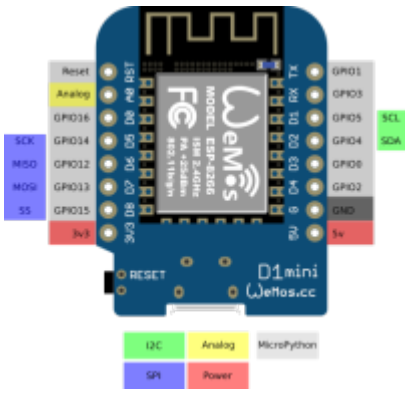
¿Para que sirven los datos?

https://www.behance.net/gallery/82992729/Dear-Data-Postcard

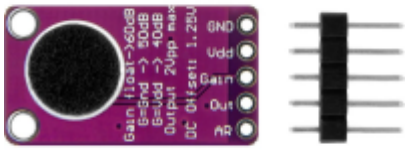
http://www.visualcomplexity.com/vc/project_details.cfm?id=666&index=27&domain=Music

Componentes

ESP 8266



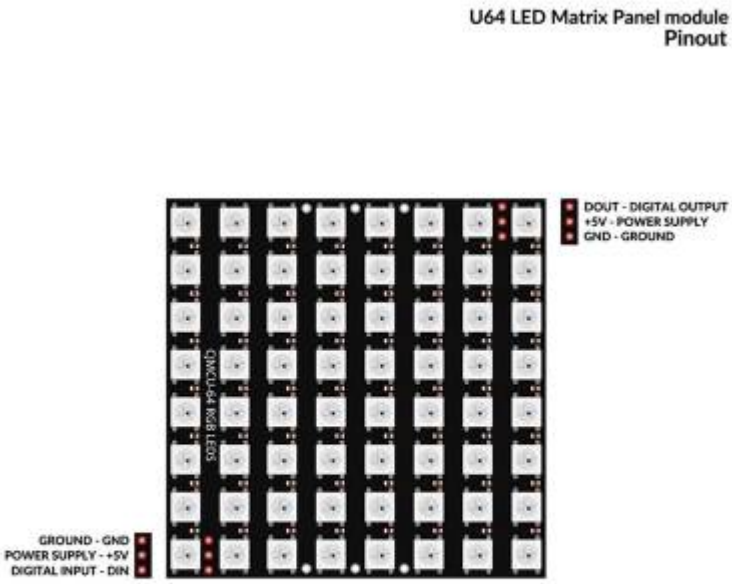
Micrófono



Amplificador

https://www.maximintegrated.com/en/products/analog/audio/MAX9814.html

Matriz de leds



Aplicación Android

https://play.google.com/store/apps/details?id=name.antonsmirnov.android.arduinodroid2&hl=es&gl=CO

Entorno para desktop

Windows:https://www.arduino.cc/en/software

Github y Código

Repositorios de github: https://github.com/unloquer/ETSesnor

Repositorio del código sesión 2: intensidad

https://github.com/unloquer/ETSesnor/blob/main/src/src.ino

Descargar repositorio codigo para programar una “imagen” en la matriz

https://github.com/unloquer/ETSesnor

Ejemplo básico

ejemplo.ino

```
#include <FastLED.h>
#define LED_PIN D3
#define LED_TYPE WS2812B
#define COLOR_ORDER GRB
#define amarillo CRGB::Yellow
#define negro CRGB::Black
#define rojo CRGB::Red
#define azul CRGB::Blue
#define maplv1 0x00FF00
#define maplv2 0x00AA00
#define maplv3 0xFFFF00
#define maplv4 0xFFE994
#define maplv5 0xFFAA00
#define maplv6 0xEC9BA4
#define maplv7 0xE1AA00
#define maplv8 0xFF00FF
#define maplv9 0x00DAFE
#define maplv10 0x0181FE

const uint8_t matrixWidth  = 8;
const uint8_t matrixHeight = 8;
#define NUM_LEDS (matrixWidth * matrixHeight)

int BRIGHTNESS = 60;
```

```
CRGB leds[matrixWidth * matrixHeight];

int loop_cnt = 0;
const int sampleWindow = 50; // Sample window width in mS (50 mS =
20Hz)
unsigned int sample;

void setup() {
  Serial.begin(115200);
  LEDS.addLeds<LED_TYPE,LED_PIN,COLOR_ORDER>(leds,NUM_LEDS);
  FastLED.setBrightness(BRIGHTNESS);
}

#define ESCENAS 1
CRGB matrix[ESCENAS][8][8] = {
  {
    {azul, azul, azul,azul, azul, azul, azul,azul},
    {azul, azul, azul,azul, azul, azul, azul,azul},
    {azul, azul, azul,azul, azul, azul, azul,azul},
    {azul, azul, azul,azul, azul, azul, azul,azul},
    {azul, azul, azul,azul, azul, azul, azul,azul},
    {azul, azul, azul,azul, azul, azul, azul,azul},
    {azul, azul, azul,azul, azul, azul, azul,azul},
    {azul, azul, azul,azul, azul, azul, azul,azul},
  },
};

void loop() {
  for(int i = 0; i< matrixHeight; i++) {
    for(int j = 0; j< matrixWidth; j++) {
      leds[i*matrixWidth + j] = matrix[loop_cnt%ESCENAS][i][j];
    }
  }
  unsigned long startMillis = millis();  // Start of sample window
  unsigned int peakToPeak = 0;

  unsigned int signalMax = 0;
  unsigned int signalMin = 1024;

  // collect data for 50 mS
  while (millis() - startMillis < sampleWindow)
   {
      sample = analogRead(0);
      if (sample < 1024) {
        if (sample > signalMax)
        {
          signalMax = sample;
        }
        else if (sample < signalMin)
        {
          signalMin = sample;
```

```
        }
      }

   }
   peakToPeak = signalMax - signalMin;
   int changeBrightness = map(peakToPeak, 20, 500, 0, 100);
   FastLED.setBrightness(changeBrightness);
   FastLED.show();
   Serial.println(peakToPeak);
   loop_cnt++;
   FastLED.clear();
}
```

🔧 Fix Me!

Ejemplo Funciones

ejemplo.ino

```
#include <FastLED.h>
#define LED_PIN D3
#define LED_TYPE WS2812B
#define COLOR_ORDER GRB
#define amarillo CRGB::Yellow
#define negro CRGB::Black
#define rojo CRGB::Red
#define azul CRGB::Blue
#define maplv1 0x00FF00
#define maplv2 0x00AA00
#define maplv3 0xFFFF00
#define maplv4 0xFFE994
#define maplv5 0xFFAA00
#define maplv6 0xEC9BA4
#define maplv7 0xE1AA00
#define maplv8 0xFF00FF
#define maplv9 0x00DAFE
#define maplv10 0x0181FE

const uint8_t matrixWidth  = 8;
const uint8_t matrixHeight = 8;
#define NUM_LEDS (matrixWidth * matrixHeight)

int BRIGHTNESS = 60;
CRGB leds[matrixWidth * matrixHeight];

int loop_cnt = 0;
```

```
const int sampleWindow = 50; // Sample window width in mS (50 mS =
20Hz)
unsigned int sample;

void setup() {
  Serial.begin(115200);
  LEDS.addLeds<LED_TYPE,LED_PIN,COLOR_ORDER>(leds,NUM_LEDS);
  FastLED.setBrightness(BRIGHTNESS);
}

#define ESCENAS 1
CRGB matrix[ESCENAS][8][8] = {
  {
    {azul, azul, azul,azul, azul, azul, azul,azul},
    {azul, azul, azul,azul, azul, azul, azul,azul},
    {azul, azul, azul,azul, azul, azul, azul,azul},
    {azul, azul, azul,azul, azul, azul, azul,azul},
    {azul, azul, azul,azul, azul, azul, azul,azul},
    {azul, azul, azul,azul, azul, azul, azul,azul},
    {azul, azul, azul,azul, azul, azul, azul,azul},
    {azul, azul, azul,azul, azul, azul, azul,azul},
  },
};

void loop() {
  for(int i = 0; i< matrixHeight; i++) {
    for(int j = 0; j< matrixWidth; j++) {
      leds[i*matrixWidth + j] = matrix[loop_cnt%ESCENAS][i][j];
    }
  }
  unsigned long startMillis = millis();  // Start of sample window
  unsigned int peakToPeak = 0;

  unsigned int signalMax = 0;
  unsigned int signalMin = 1024;

  // collect data for 50 mS
  while (millis() - startMillis < sampleWindow)
   {
      sample = analogRead(0);
      if (sample < 1024) {
        if (sample > signalMax)
        {
          signalMax = sample;
        }
        else if (sample < signalMin)
        {
          signalMin = sample;
        }
      }
```

```
    }
    peakToPeak = signalMax - signalMin;
    int changeBrightness = map(peakToPeak, 20, 500, 0, 100);
    FastLED.setBrightness(changeBrightness);
    FastLED.show();
    Serial.println(peakToPeak);
    loop_cnt++;
    FastLED.clear();
}
```

Librería para escribir en la matriz

libmatrix.ino

```
#include <Arduino.h>
#include <FastLED.h>
#include <algorithm>
#define LED_PIN D3
#define LED_TYPE WS2812B
#define COLOR_ORDER GRB

/*
**
** https://github.com/FastLED/
** https://github.com/gmoehrke/FastFX
** https://www.reddit.com/r/FastLED/wiki/index/user_examples
** https://macetech.github.io/FastLED-XY-Map-Generator/
**
*/

#define amarillo CRGB::Yellow
#define negro CRGB::Black
#define rojo CRGB::Red
#define azul CRGB::Blue
#define morado CRGB::Purple
#define naranja CRGB::OrangeRed
#define verde CRGB::Green
#define aguamarina CRGB::Cyan
#define rosado CRGB::Fuchsia
#define verdedos CRGB::LimeGreen
#define raro CRGB::DarkOrchid
#define rarodos CRGB::DeepPink
#define maplv1 0x00FF00
```

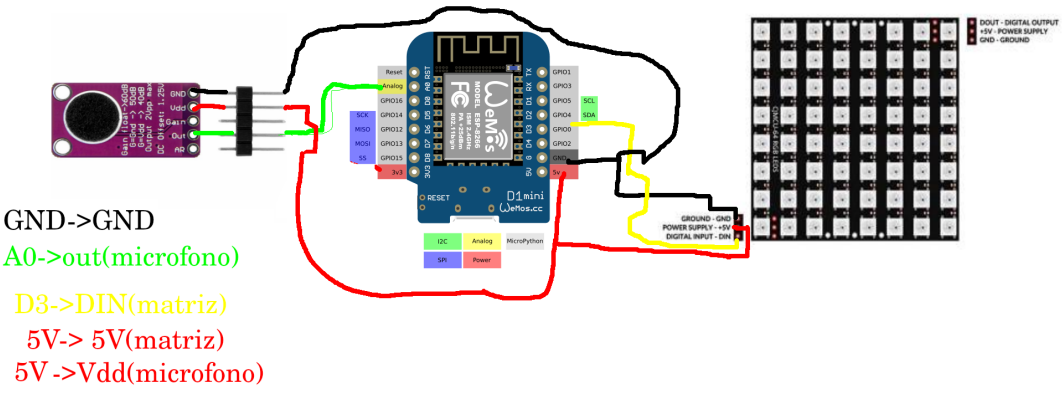
```
#define maplv2 0x00AA00
#define maplv3 0xFFFF00
#define maplv4 0xFFE994
#define maplv5 0xFFAA00
#define maplv6 0xEC9BA4
#define maplv7 0xE1AA00
#define maplv8 0xFF00FF
#define maplv9 0x00DAFE
#define maplv10 0x0181FE

const uint8_t matrixWidth = 8;
const uint8_t matrixHeight = 8;
#define NUM_LEDS (matrixWidth * matrixHeight)

int BRIGHTNESS = 10;
CRGB leds[matrixWidth * matrixHeight];

const int sampleWindow = 50; // Sample window width in mS (50 mS =
20Hz)
unsigned int sample;

class Matrix {
  CRGB *leds = NULL;
  uint8_t numLeds = 0;
  uint8_t currBrightness = 0;

public:
  Matrix(CRGB *initLeds, uint8_t initNum) {
    leds = initLeds;
    numLeds = initNum;
  }

  // fill all matrix with same color
  void fill(CRGB color) {
    for (int i = 0; i < 64; i++) {
      leds[i] = color;
    }
  };
  // fill a binary shape with same color
  // {
  //  B00000000,
  //  B10101010,
  //  B00000000,
  //  B10101010,
  //  B00000000,
  //  B10101010,
  //  B00000000,
  //  B10101010
  //  };
  void fill(CRGB color, byte *shape) {
    for (int i = 0; i < matrixHeight; i++) {
```

```
      for (int j = 0; j < matrixWidth; j++) {
        if (shape[i] & 1 << j) {              // if bitwise AND
resolves to
          leds[i * matrixHeight + j] = color; // send 1
        }
      }
    }
  };
  // fill color shape
  void fill(CRGB color_shape[][8]) {
    for (int i = 0; i < matrixHeight; i++) {
      for (int j = 0; j < matrixWidth; j++) {
        leds[i * matrixHeight + j] = color_shape[i][j]; // send 1
      }
    }
  };
  // fill row with color
  void fill_y(CRGB color, int row) {
    for (int j = 0; j < matrixWidth; j++) {
      leds[row * matrixHeight + j] = color; // send 1
    }
  };
  void fill_y_until(CRGB color_shape[][8], int until) {
    for (int i = 0; i < until; i++) {
      for (int j = 0; j < matrixWidth; j++) {
        leds[i * matrixHeight + j] = color_shape[i][j]; // send 1
      }
    }
  };
  // fille column with color
  void fill_x(CRGB color, int column) {
    for (int i = 0; i < matrixHeight; i++) {
      leds[i * matrixHeight + column] = color; // send 1
    }
  };
  void fill_x_until(CRGB color_shape[][8], int until) {
    for (int i = 0; i < matrixHeight; i++) {
      for (int j = 0; j < until; j++) {
        leds[i * matrixHeight + j] = color_shape[i][j]; // send 1
      }
    }
  };
  // of array in matrix
  int sound_scale();        // return the actual level of sound
intensity
  void color_scale(int sl); // return color for 10 levels of sound
intensity
};

Matrix *mym;
```

```
byte sshape[8] = {B00000000, B10101010, B00000000, B10101010,
                  B00000000, B10101010, B00000000, B10101010};

CRGB matrix[8][8] = {
    {maplv2, maplv2, negro, negro, negro, negro, negro, negro},
    {maplv3, maplv3, maplv3, negro, negro, negro, negro, negro},
    {maplv4, maplv4, maplv4, maplv4, negro, negro, negro, negro},
    {maplv5, maplv5, maplv5, maplv5, maplv5, negro, negro, negro},
    {maplv6, maplv6, maplv6, maplv6, maplv6, maplv6, negro, negro},
    {maplv7, maplv7, maplv7, maplv7, maplv7, maplv7, maplv7, negro},
    {maplv8, maplv8, maplv8, maplv8, maplv8, maplv8, maplv8, maplv8},
    {maplv9, maplv9, maplv9, maplv9, maplv9, maplv9, maplv9, maplv9},
};

unsigned int sample_sound() {
  unsigned long startMillis = millis(); // Start of sample window
  unsigned int peakToPeak = 0;

  unsigned int signalMax = 0;
  unsigned int signalMin = 1024;

  // collect data for 50 mS
  while (millis() - startMillis < sampleWindow) {
    sample = analogRead(0);
    if (sample < 1024) {
      if (sample > signalMax) {
        signalMax = sample;
      } else if (sample < signalMin) {
        signalMin = sample;
      }
    }
  }

  peakToPeak = signalMax - signalMin;

  return peakToPeak;
}

void setup() {
  Serial.begin(115200);
  LEDS.addLeds<LED_TYPE, LED_PIN, COLOR_ORDER>(leds, NUM_LEDS);
  mym = new Matrix(leds, 64);
  FastLED.setBrightness(BRIGHTNESS);
}

void loop() {
  int sample = sample_sound();
  // tomado de https://forum.arduino.cc/t/map-but-log/379910/3
  int logmaplv = log(sample + 1) / log(900) * 9;
  Serial.println(logmaplv);
```

```
  for (int i = 0; i <= logmaplv; i++) {
    mym->fill_y_until(matrix, i);
    FastLED.show();
    FastLED.delay(30);
  }

  FastLED.clear();
}
```

Diagrama electronico



Descargar repositorio codigo para programar varios estados en la matriz

Referentes

- https://www.reddit.com/r/FastLED/wiki/index/user_examples
- https://connornishijima.github.io/Pixie_Chroma/?section=shortcodes

Contacto

https://t.me/unloquer

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Permanent link:
https://wiki.unloquer.org/proyectos/talleres/ets?rev=1696203180

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