

# SENSOR GLASSES

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# INTRODUCTION

- 36 millions d'aveugles dans le monde
- 237 millions de déficience visuelle
- Ces chiffres devraient doubler d'ici 2050
- Peu de solutions concrètes et peu d'attention sur ces personne

## **PROBLEMATIQUE :**

Que pouvons-nous apporter pour améliorer le quotidien de ces personnes?

# ETAT DE L'ART

- Lunettes pour aveugles présents en France depuis 2017
- Prix variant moyennement entre 300 et 5000 euros
- Marché encore très peu connu, peu de concurrence
- Peu de chiffres et peu d'information sur internet
- Aucune annonce marketing et publicité = néo-marché en pleine croissance

## Quelques exemples qui se font actuellement :



AngelEye Smart Glasses



Orcam MyEye 2

# NOS OBJECTIFS

- S'orienter dans une ville peuplée = parcours du combattants
- Créer des lunettes répondant à ce problème
- Détecter l'obstacle et avertir la personne malvoyante
- Reconnaître l'obstacle et lui en énoncer la nature



# COMPOSANTS UTILISÉS



Buzzer Arduino



ESP32-CAM



Capteur Ultrasonique HC-SR04



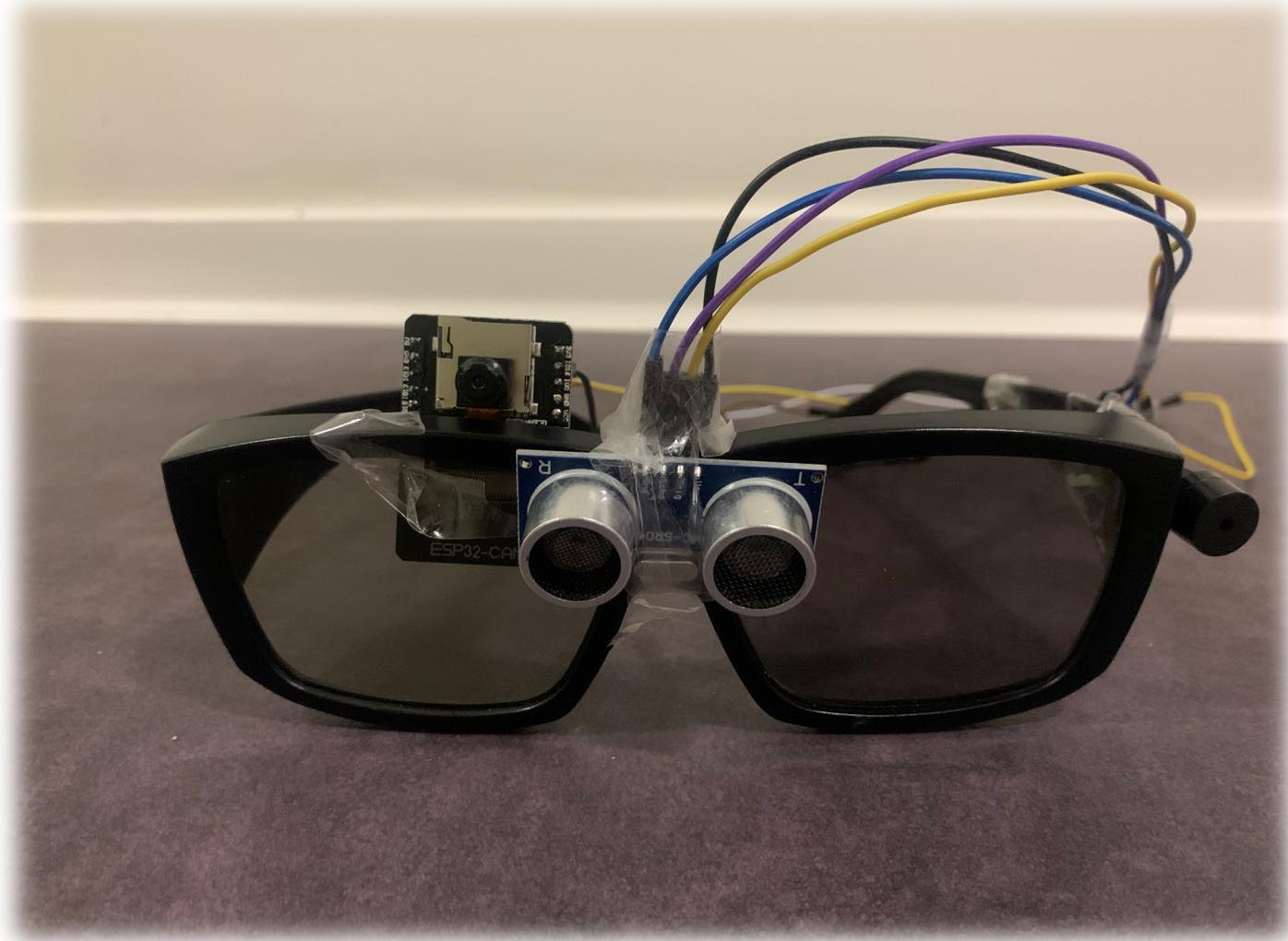
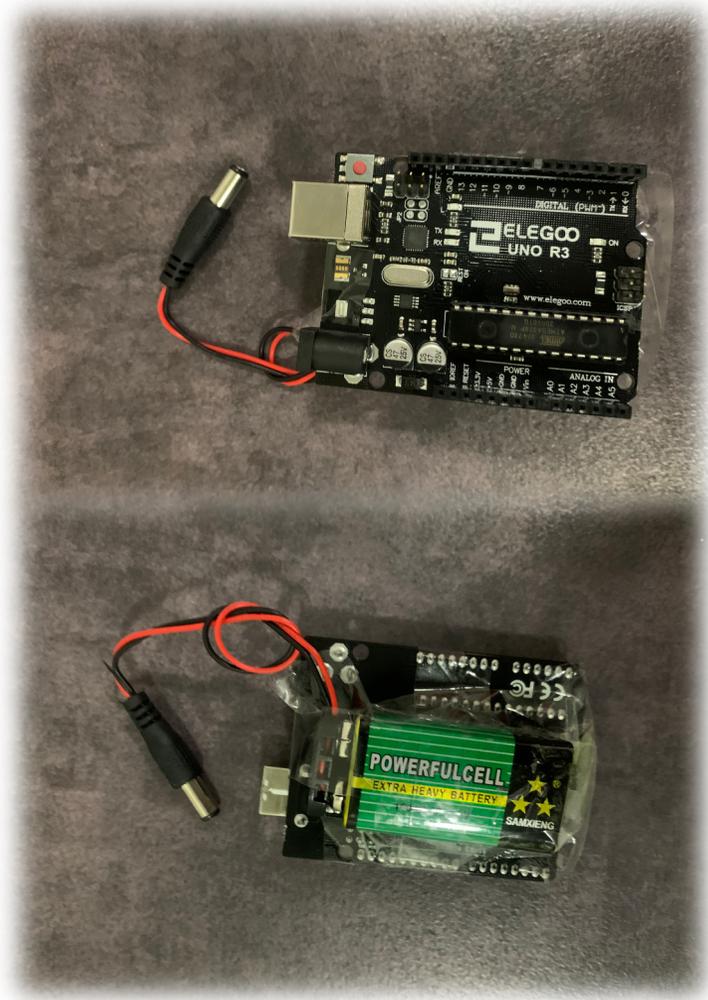
Carte Arduino Uno



Pile Greencell pour arduino

**Budget total : 100 euros (composants utilisés et non utilisés)**

# PROTOTYPE FINAL



# DÉTECTION D'OBSTACLE

```
const int TrigPin = 2;
const int EchoPin = 3;
float cm;
#define buzzer 5
void setup(){
  Serial.begin(9600);
  pinMode(TrigPin, OUTPUT);
  pinMode(EchoPin, INPUT);
}
void loop(){
  digitalWrite(TrigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(TrigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(TrigPin, LOW);
  cm = pulseIn(EchoPin, HIGH) / 58.0; //The echo time is converted into cm
  cm = (int(cm * 100.0)) / 100.0;    //Keep two decimal places
  Serial.print("Distance\t=\t");
  Serial.print(cm);
  Serial.print("cm");
  Serial.println();
  delay(500);
  if (100 <= cm && cm <= 150){
    tone(buzzer, 400, 100);

  }

  else if (75 <= cm && cm < 100){
    tone(buzzer, 400, 200);
  }

  else if (50 <= cm && cm < 75){
    tone(buzzer, 400, 300);
  }
}
```



# RECONNAISSANCE FACIALE

```
#include "esp_camera.h"
#include <WiFi.h>

//
// WARNING!!! Make sure that you have either selected ESP32 Wrover Module,
//           or another board which has PSRAM enabled
//

// Select camera model
// n n fcf#define CAMERA_MODEL_WROVER_KIT
//#define CAMERA_MODEL_ESP_EYE
//#define CAMERA_MODEL_M5STACK_PSRAM
//#define CAMERA_MODEL_M5STACK_WIDE
#define CAMERA_MODEL_AI_THINKER

#include "camera_pins.h"

const char* ssid = "iPhone de San";
const char* password = "xperia_Z3";

void startCameraServer();

void setup() {
  Serial.begin(115200);
  Serial.setDebugOutput(true);
  Serial.println();
```

```
camera_config_t config;
config.ledc_channel = LEDC_CHANNEL_0;
config.ledc_timer = LEDC_TIMER_0;
config.pin_d0 = Y2_GPIO_NUM;
config.pin_d1 = Y3_GPIO_NUM;
config.pin_d2 = Y4_GPIO_NUM;
config.pin_d3 = Y5_GPIO_NUM;
config.pin_d4 = Y6_GPIO_NUM;
config.pin_d5 = Y7_GPIO_NUM;
config.pin_d6 = Y8_GPIO_NUM;
config.pin_d7 = Y9_GPIO_NUM;
config.pin_xclk = XCLK_GPIO_NUM;
config.pin_pclk = PCLK_GPIO_NUM;
config.pin_vsync = VSYNC_GPIO_NUM;
config.pin_href = HREF_GPIO_NUM;
config.pin_sscb_sda = SIOD_GPIO_NUM;
config.pin_sscb_scl = SIOC_GPIO_NUM;
config.pin_pwdn = PWDN_GPIO_NUM;
config.pin_reset = RESET_GPIO_NUM;
config.xclk_freq_hz = 20000000;
config.pixel_format = PIXFORMAT_JPEG;
//init with high specs to pre-allocate larger buffers
if(psramFound()){
  config.frame_size = FRAMESIZE_UXGA;
  config.jpeg_quality = 10;
  config.fb_count = 2;
} else {
  config.frame_size = FRAMESIZE_SVGA;
  config.jpeg_quality = 12;
  config.fb_count = 1;
}
```

```

#if defined(CAMERA_MODEL_ESP_EYE)
    pinMode(13, INPUT_PULLUP);
    pinMode(14, INPUT_PULLUP);
#endif

// camera init
esp_err_t err = esp_camera_init(&config);
if (err != ESP_OK) {
    Serial.printf("Camera init failed with error 0x%x", err);
    return;
}

sensor_t * s = esp_camera_sensor_get();
//initial sensors are flipped vertically and colors are a bit saturated
if (s->id.PID == OV3660_PID) {
    s->set_vflip(s, 1); //flip it back
    s->set_brightness(s, 1); //up the blightness just a bit
    s->set_saturation(s, -2); //lower the saturation
}
//drop down frame size for higher initial frame rate
s->set_framesize(s, FRAMESIZE_QVGA);

#if defined(CAMERA_MODEL_M5STACK_WIDE)
    s->set_vflip(s, 1);
    s->set_hmirror(s, 1);
#endif

```

```

WiFi.begin(ssid, password);

while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
}
Serial.println("");
Serial.println("WiFi connected");

startCameraServer();

Serial.print("Camera Ready! Use 'http://");
Serial.print(WiFi.localIP());
Serial.println("' to connect");
}

void loop() {
    // put your main code here, to run repeatedly:
    delay(10000);
}

```

COM7

Envoyer

```
clk_drv:0x00,q_drv:0x00,d_drv:0x00,cs0_drv:0x00,hd_drv:0x00,wp_drv:0x00
```

```
mode:DIO, clock div:2
```

```
load:0x3fff0018,len:4
```

```
load:0x3fff001c,len:1216
```

```
ho 0 tail 12 room 4
```

```
load:0x40078000,len:9720
```

```
ho 0 tail 12 room 4
```

```
load:0x40080400,len:6364
```

```
entry 0x400806b8
```

```
WiFi connected
```

```
Starting web server on port: '80'
```

```
Starting stream server on port: '81'
```

```
Camera Ready! Use 'http://172.20.10.2' to connect
```

# CONCLUSION



Complication rencontrées



Expérience enrichissante



Les acquis et les compétence



Amélioration possible