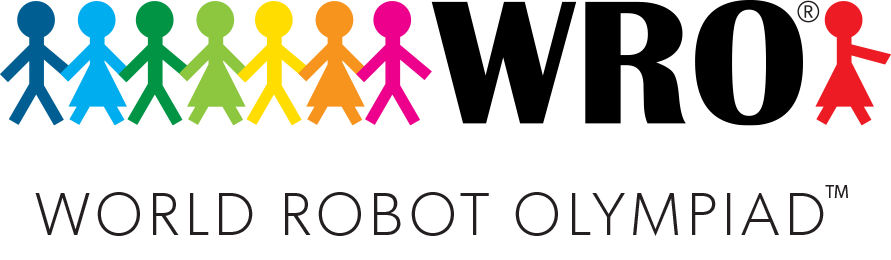
**WORLD ROBOT OLYMPIAD**



**Magic Eyes**

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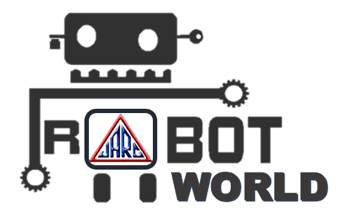
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# **Team Presentation**



**Team**: Robot World

**Motto**: "We will always see beyond".

**Who are the members?**

Cristel Espinosa

Celideth Gonzalez

Daniella Tejedor

## **How is the work divided?**

Cristel Espinosa - Arduino Project - Wall - Programming

Celideth González - Arduino Project - Written Work - arduino assembly

Eliseo Guerra - Layout - Commissioning - arduino assembly

## **Photos of the Participants:**

# **Executive Summary**

Our project seeks to improve the quality of life of people with visual impairment and displacement in the social sphere, we have chosen this project because every day we visualize how people with visual impairment spend work in the streets of the city, parks, shops and transport.

The robotic solution will solve this problem by means of ultrasonic sensors and different devices that will help it to execute a vibration when the person has an object at a certain distance. We know that this ultrasonic sensor is based on the use of ultrasonic waves that are not perceived by the human being.

The value of our robotic solution is of great social value to us since all the people must have the security and certainty to move from one place to another without fear of colliding against something or hurt us in the execution of the same one.

If we use this intelligent glove as soon as the person hears the whistle or sounds, vibration in his hands, he will already have the information that he has some kind of object nearby, since by means of the sound they are related to sound waves consisting of oscillations of the air pressure that are converted into mechanical waves in the human ear interpreted by the brain.

The importance of our project is based on the evolution of life of thousands of people who have a visual disability and it is difficult for them in their daily life when walking, looking for a job, among others.

## **Presentation of your robotic solution**

This solution arises with the need to help or promote a better life for people with visual impairment, we came up with this idea investigating ideas of all types which we highlight this one of the most important or necessary in the real world, within the programmed ideas we have the same project but with different materials that carry out a band or cap in which the Arduino project is mounted, sensors, horn and others, in order that people with visual impairment do not have to always use your hand to move from one place to another, if not to walk quietly and safely in a straight position with a look ahead to move much more easily. Among the projects that we found we have: the project of the home vacuum cleaner which is used to vacuum dust and other small particles of dirt, usually from the floor. Nowadays it is an indispensable equipment for the maintenance and cleaning for the home, as well as for the office and schools, we can make it with the following materials: a plastic bottle, a small 12V motor and its batteries, a rubber gun, scissors, a piece of brine, adhesive tape and tey. A fire extinguisher is a device capable of blocking some of the elements that provoke the combustion of the fire, hindering its development, that is to say, extinguishing the fire. It can contain water or a variety of chemical components. We can make this projector including thread, paper napkin, straw or a plastic hose, perforated cork stopper or plasticine, small water bottle that is very dry (if you wish you can dye it), candle, lighter, baking soda, vinegar (acetic acid). We found the homemade water fountains that are carried out with the objective of reducing the excessive use of water in the fountains, build a fountain easy to handle for continuous use, this project contributes to the decoration of businesses, halls, gardens, and any place in general. We can make this project with the following materials: scissors, drill, a small submersible water pump, a flow control valve, pots with drainage holes, clay dishes of different sizes according to the design of the garden fountain, silicone and foam sealant.

If we have found similar ideas available the difference of our project is carried out in the reduction of materials, minimizing or trying to occupy less space in the base that we have that is the glove so it does not weigh or feel like a burden on the hand of the individual, This leads us to have a very good project for and for the benefit of the people who need to use it, always looking for comfort, better comfort, welfare and most of all to feel good with this project, so that the person can improve their self-esteem, quality of life, performance in society, in schools, amusement parks, streets and avenues of the city.

## **Description of the materials**

Among the different materials used to develop our project we can mention the ultrasonic sensor is a low cost distance sensor that uses ultrasound to determine the distance of an object in a range of 2 to 450 cm. It stands out for its small size, low power consumption, good accuracy and excellent price. It is most commonly used in robotics projects such as maze or sumo robots, and in automation projects such as level or distance measurement systems. The operation of the sensor is as follows: the piezoelectric emitter emits 8 ultrasound pulses (40KHz) after receiving the order in the TRIG pin, the sound waves travel in the air and bounce when they find an object, the bounce sound is detected by the piezoelectric receiver, then the ECHO pin switches to High (5V) for a time equal to the time it took the wave since it was emitted until it was detected, the ECO pulse time is measured by the microcontroller and thus the distance to the object can be calculated.

Arduino: It is a development platform based on a free hardware electronic board that incorporates a reprogrammable microcontroller and a series of female pins. These allow to establish connections between the microcontroller and the different sensors and actuators in a very simple way (mainly with dupont cables). Why do we use Arduino? Because it allows us to have a rich ecosystem of unofficial electronic boards for different purposes and third party software libraries, which can be better adapted to our needs. Its C++ based programming language is easy to understand. C++ allows an easy entry for new programmers and at the same time with such a great capacity, that the most advanced programmers can squeeze all the potential of its language and adapt it to any situation.

Pushbutton: It is an electrical component that allows or prevents the passage of electric current when pressed or pressed.

Loudspeaker: Devices that convert an electrical signal into a sound wave. These devices do not have internal electronics, so we have to provide an electrical signal to get the desired sound. is accompanied on a plate for easy connection, which incorporates a transistor and resistors needed to operate the passive buzzer or speaker without connecting it. Technically both buzzers and loudspeakers are electroacoustic transducers, i.e. devices that convert electrical signals into sound.

Gloves: It is a garment, whose purpose is to shelter the hands, or protect them from blows, scratches, extreme heat or a harmful substance. In this case we use it as a base or in disposition to our project.

Plastic bottle: We consider using it because it has a high resistance to wear and corrosion, in addition to preserving the temperature of the product and keeping them out of reach of dust, grease and other toxic factors that may be present in the environment. At the same time, if we recycle plastic, we will be consuming less raw materials and less natural and non-renewable energy resources.

USB cable: It is the connector that allows linking different elements through the Universal Serial Bus. Its original purpose was to exchange information. Nowadays, USB cables can not only share information, but also power devices.

# **Sustainable objectives**

The objectives of our project are framed within the following SDGs:

**Goal 3:** Ensure healthy lives and promote well-being for all at all ages.

Ensuring healthy lives and promoting well-being for all at all ages is essential for sustainable development.

Today, the world is facing an unprecedented global health crisis; EVID-19 is spreading human suffering, destabilizing the global economy, and drastically changing the lives of billions of people around the world.

Prior to the pandemic, great strides were made in improving the health of millions of people. In particular, these great strides were achieved by increasing life expectancy and reducing some of the common causes of death associated with infant and maternal mortality. However, more efforts are needed to completely eradicate a wide range of diseases and address a large number of ongoing and emerging health problems. Through more efficient financing of health systems, improved sanitation and hygiene, and greater access to medical personnel, significant progress can be made in helping to save the lives of millions of people.[1] Health emergencies, such as those that occur in the developing world, are a major cause of death and disease.

Health emergencies, such as the one resulting from COVID-19, pose a global risk and have shown that preparedness is vital. The United Nations Development Program noted the vast differences in countries' capacities to deal with and recover from the COVID-19 crisis. The pandemic is a turning point in terms of preparedness for health emergencies and investment in vital public services in the 21st century.

At the health level it can help people with profound or severe visual impairment, helping them to mobilize in the different avenues of Panama.

In addition, an emphasis can be made on objective 5, which indicates gender, especially in these times when female participation is important in innovation:

**Goal 5:** Achieve gender equality and empower all women and girls.

Gender equality is not only a fundamental human right, it is one of the essential foundations for building a peaceful, prosperous and sustainable world.

Some progress has been made over the past few decades: more girls are in school, and fewer girls are being forced into early marriage; more women are holding office in parliaments and leadership positions; and laws are being reformed to promote gender equality.

Despite these achievements, many challenges remain: discriminatory laws and social norms remain pervasive, women continue to be underrepresented at all levels of political leadership, and 1 in 5 women and girls aged 15-49 report experiencing sexual or physical violence at the hands of an intimate partner in a 12-month period.

The effects of the COVID-19 pandemic could reverse the few gains that have been made in gender equality and women's rights. The coronavirus outbreak exacerbates existing inequalities for women and girls globally; from health and economics, to security and social protection.

Women play a disproportionate role in the response to the virus, including as frontline health workers and home-based caregivers. Women's unpaid care work has increased significantly as a result of school closures and increased needs of the elderly. Women are also more affected by the economic effects of COVID-19 as they work, disproportionately, in insecure labor markets. Nearly 60% of women work in the informal economy, further exposing them to poverty.

The pandemic has also led to a sharp increase in violence against women and girls. With confinement measures in place, many women find themselves trapped at home with their abusers, with difficulty accessing services that are suffering from cuts and restrictions. New data show that, since the outbreak of the pandemic, violence against women and girls (and especially domestic violence) has intensified.[2] In gender equality, it is incumbent on us to ensure that women's rights are respected.

Gender equality is of importance to us as we will all have equal rights and access to use it equally.

Other important objectives used by our project are the following:

**Goal 9:** Build resilient infrastructure, promote sustainable industrialization and foster innovation.

Inclusive and sustainable industrialization, together with innovation and infrastructure, can unleash the dynamic and competitive economic forces that generate employment and income. These play a key role in introducing and promoting new technologies, facilitating international trade and enabling the efficient use of resources.

However, there is still a long way to go before the world can take full advantage of this potential. In particular, the least developed countries need to accelerate the development of their manufacturing sectors if they are to achieve the 2030 target and increase investment in scientific research and innovation.

Growth in the global manufacturing sector has been steadily declining, even before the outbreak of the COVID-19 pandemic. The pandemic is severely affecting manufacturing industries and is causing disruptions in global value chains and product supply.

Innovation and technological progress are key to discovering lasting solutions to economic and environmental challenges, such as increasing energy and resource efficiency. Globally, investment in research and development (R&D) as a percentage of GDP increased from 1.5% in 2000 to 1.7% in 2015, and continued at almost the same level in 2017. However, in developing regions it was less than 1 %.

In terms of communications infrastructure, more than half of the world's population is now connected and almost the entire global population lives in an area with mobile network coverage. It is estimated that, in 2019, 96.5 % of the population had at least 2G network coverage.[3] In the industry section, innovaphone is the only company in the world with a mobile network coverage.

In the industry, innovation and infrastructure section we seek to play and promote technology in the daily life and social environment of people with visual impairment.

**Goal 10:** Reduce inequality within and between countries

Reducing inequality and ensuring that no one is left behind is integral to achieving the Sustainable Development Goals.

Inequality within and between countries is a continuing concern. Despite some positive signs towards reducing inequality in some dimensions, such as reduced income inequality in some countries and preferential trade status benefiting low-income countries, inequality still continues.

COVID-19 has intensified existing inequalities and has affected the poor and the most vulnerable communities more than anyone else. It has brought to light the economic inequalities and fragile social safety nets that leave vulnerable communities to suffer the consequences of the crisis. At the same time, social, political and economic inequalities have amplified the effects of the pandemic.

On the economic front, the COVID-19 pandemic has significantly increased global unemployment and drastically cut workers' incomes.

COVID-19 also jeopardizes what little progress has been made in gender equality and women's rights over the past few decades. In virtually every area, from health to economics, from security to social protection, the effects of COVID-19 have worsened the situation of women and girls simply as a result of their sex.[4]

Inequalities are also increasing for vulnerable populations in countries with weaker health systems and in countries facing existing humanitarian crises. Refugees and migrants, as well as indigenous peoples, the elderly, people with disabilities and children are particularly at risk of exclusion. In addition, hate speech directed at vulnerable groups is on the rise.

In the area of reducing inequalities by ensuring that no one is restricted from using it as the project would be for everyone.

**Goal 17:** Revitalize the Global Partnership for Sustainable Development

The SDGs can only be achieved with strong global partnerships and cooperation.

Successful delivery of a development agenda requires inclusive partnerships (at global, regional, national and local levels) on principles and values, as well as on a shared vision and goals that focus on people and planet first.

Many countries require official development assistance to promote growth and trade. Yet aid levels are declining and donor countries have not honored their commitment to increase development funding.

Due to the COVID-19 pandemic, the global economy is expected to contract sharply, by 3%, by 2020, which would be its worst recession since the Great Depression.[5] Now more than ever, a robust global response is needed.

Now more than ever, strong international cooperation is needed to ensure that countries with the means to recover from the pandemic build back better and achieve the Sustainable Development Goals.

Partnerships to achieve the goals focus on different principles and values with a vision that can be shared with all people around the world.

# **Conclusion**

Our project seeks to improve the quality of life of people with visual impairment and displacement in the social sphere, we have chosen this project because every day we visualize how people with visual impairment spend work in the streets of the city, parks, shops and transport. If we use this intelligent glove as soon as the person hears the whistle or sounds, vibration in his hands, he will already have the information that he has some kind of object nearby, since by means of the sound they are related to sound waves consisting of oscillations of the air pressure that are converted into mechanical waves in the human ear interpreted by the brain.

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[2] "Gender Equality and Women's Empowerment - Sustainable Development." https://www.un.org/sustainabledevelopment/es/gender-equality/ (accessed Sep. 20, 2022).

[3] "Infrastructure - Sustainable Development." https://www.un.org/sustainabledevelopment/es/infrastructure/ (accessed Sep. 20, 2022).

[4] "Reducing Inequalities Between and Within Countries - Sustainable Development." https://www.un.org/sustainabledevelopment/es/inequality/ (accessed Sep. 20, 2022).

[5] "Partnerships - Sustainable Development." https://www.un.org/sustainabledevelopment/es/globalpartnerships/ (accessed Sep. 20, 2022).

# Annexes

URL GIT : https://github.com/CristelEspinosa/CristelEspinosa

URL Blog: <https://sites.google.com/d/1mo539p2g3GL165qOc0RmW6Fo18tVCuYk/p/1-F2HH7BWsbYdZdHC-g2e7jL-8LCoepuR/edit>

## Source Code

//declaración de las variables globales

const int trigPin= 10;

const int ecoPin=9;

int buzz=6;

void setup() {

//se utiliza serian begin para imprimir en monitor serial los datos que recolecta el sensor

Serial.begin(9600);

// pinMode activar los pines y determinar si son de entrada o salida

pinMode(trigPin, OUTPUT);

pinMode(ecoPin, INPUT);

digitalWrite(trigPin, LOW);

}

void loop()

{

//declaración de las variables locales

long t;

long d;

// digitalWrite escritura digital en los pines

digitalWrite(trigPin, HIGH);

//delayMicroseconds tiempo de espera en microsegundo

delayMicroseconds(10);

digitalWrite(trigPin, LOW);

// pulseIn Activa eco para escuchar lo que emite el trigPin del sensor ultrasonico que envia el impulso

t=pulseIn(ecoPin, HIGH);

//operación matemática cácular la distancia

d=t/2/29.1;

//impresión de los datos

Serial.print(d);

Serial.print ("cm");

Serial.println();

// delay tiempo de espera de un segundo para verificar la información

delay(1000);

// condición de distancia a la cual la persona podrá acercase o alejarse de un objeto. Sonará la bocina como advertencia de objeto cercano.

if ((d<=23))

{

// sonido

tone(buzz,700);

delay(500);

}

else

{

//rango comparado de la distancia de aviso previo al choque

if ((d>=24&& d<=100))

tone(buzz,800);

else{

// no tiene sonido

noTone(buzz);

}

}

}

## **Project images**

|  |  |
| --- | --- |
|  |  |
| **Figure 1. The Magic Eyes device** | **Figure 2: Installing the materials** |
|  |  |
| **Figure 3: Testing** | **Figure 4: creating the model** |
|  |  |
| **Figure 5: Finished device** | **Figure 6: Materials** |

## **Canva**