UNIVERSAL OBJECT COUNTER

TEAM MEMBERS:

- Ashutosh Srivastava
- Khushi Wadhwa
- Kyrylo Shyvam Kumar
- Mahika Jain

PROJECT IDEA

Objectives - Overall objective of the given project is to make a Universal Object Counter capable of counting inanimate objects as well as living people. Because of its universal nature, the project has the potential to be used for a variety of applications including :

- **Industrial sector: Making accurate quantitative measurements can be tedious when performed on a big sample space. This project aims to automate the process of counting the objects moving on the conveyor belts, and thus help in making economic decisions, saving time, and improving the accuracy of data analytics for manufacturers.**
- **Maintaining the count of people: There are a lot of places like tourist places, malls, railway stations, and the metro, where there is no upper limit on the number of people that can be present in a given time interval. Our project will count the number of people entering and exiting the area. Knowing the projected number of people (from a history of observations), together with the number of people in real-time, can help customers to schedule better their activities. Owners of these places can use these analytics to better plan the allocation of goods and workforce. In the situation of the ongoing pandemic, the information from devices is a powerful method to control the infections by restricting entry to such places once a safe limit of people is reached.**
- **More specific places, like car parking: Maintaining the count of vehicles in automated parking areas can be achieved using a given device.**

Inputs / Physical quantities measured:

- **PIR sensor detects IR light radiating from humans/living beings/heated objects. This will be used in case we need to detect a person or group of people.**
- **HC-SR04 generates an ultrasonic wave and then detects the reflected wave, giving the time for sound to reach the object as output. This**

project uses it to detect if any objects pass between the sensor and the opposite wall.

Output:

- When a person enters (or exits) the area the counter on the device increments (or decrements). The information is also sent to cloud servers to update data on a website. The given data is then processed to give a more meaningful distribution of people with respect to time.

REQUIRED COMPONENTS

- ESP32 development board
- HC-SR04 Ultrasound sensor
- HC-SR501 PIR Motion Sensor
- I2C module
- Breadboards
- Arduino Due cable
- 7 segment displays
- LEDs
- Jumper Wires (Male to Male, Female to Female, Male to Female.
- Resistors