

Controlling IoT Devices **with** **Augmented Reality**

6th Semester Summer Project

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Outline

- What we have done ?
- Introduction to IOT, IIOT and Augmented Reality
- Hardware Components
- Schematics
- Software Requirements
- Application Programming Interface
- Flowchart
- Working
- Demonstration
- Applications
- Future Development Scope

What we have done ?

PROBLEM : Imagine you work in a thermal power plant and there is an emergency where a valve of heating system has broken. you are the incharge of repairing that valve but due to high heat you are facing problems. If your company was using the idea that i am going to discuss next, this task would be very simple to perform.

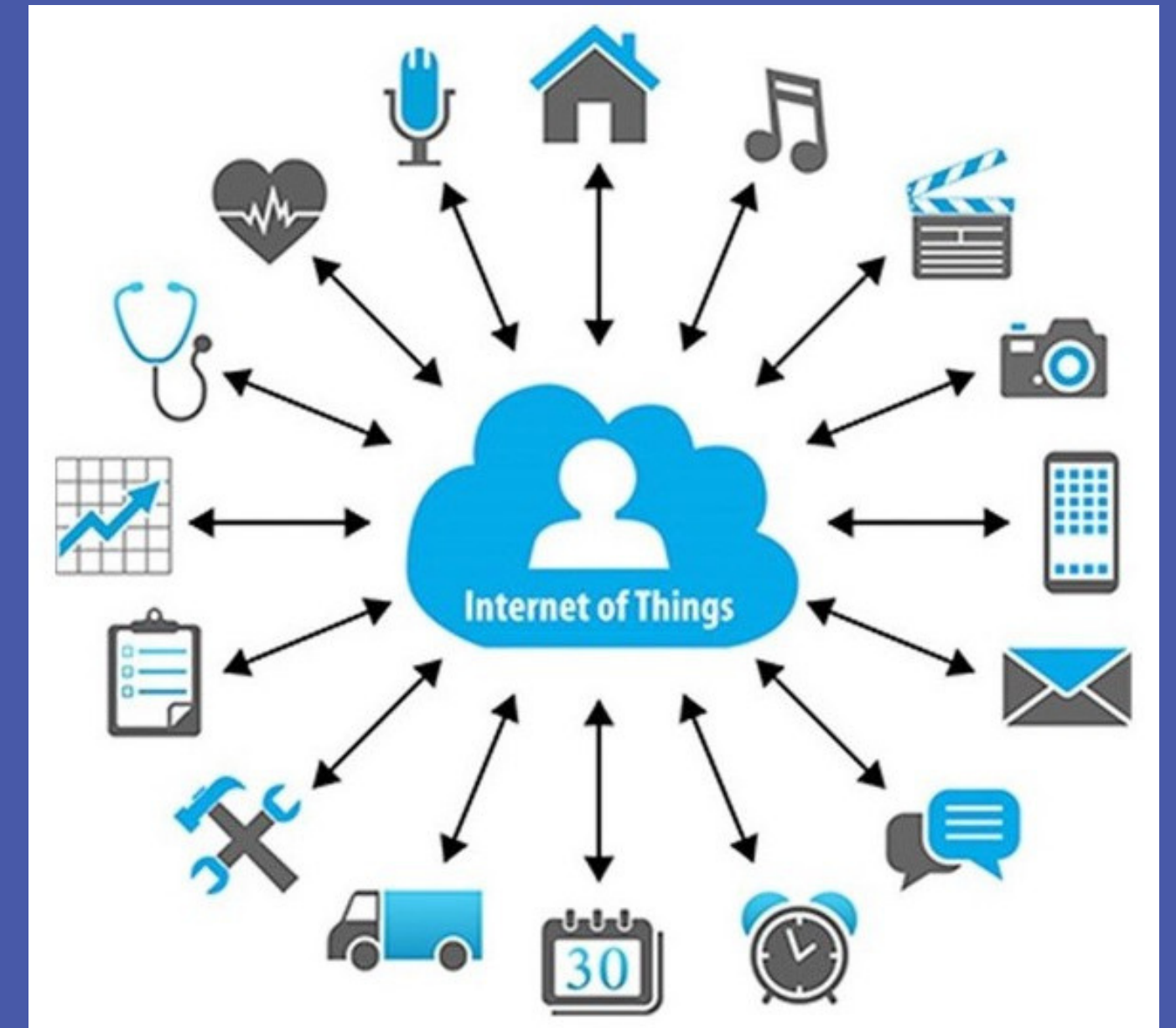
SOLUTION : We've created an IoT and augmented reality system that can be used to operate devices without requiring physical interaction.

To create a prototype of our concept, we used basic and open source platforms. The prototype includes two gadgets that are meant to showcase the notion of utilising an AR interface to operate and obtain data from an IoT device.

What is IoT ?

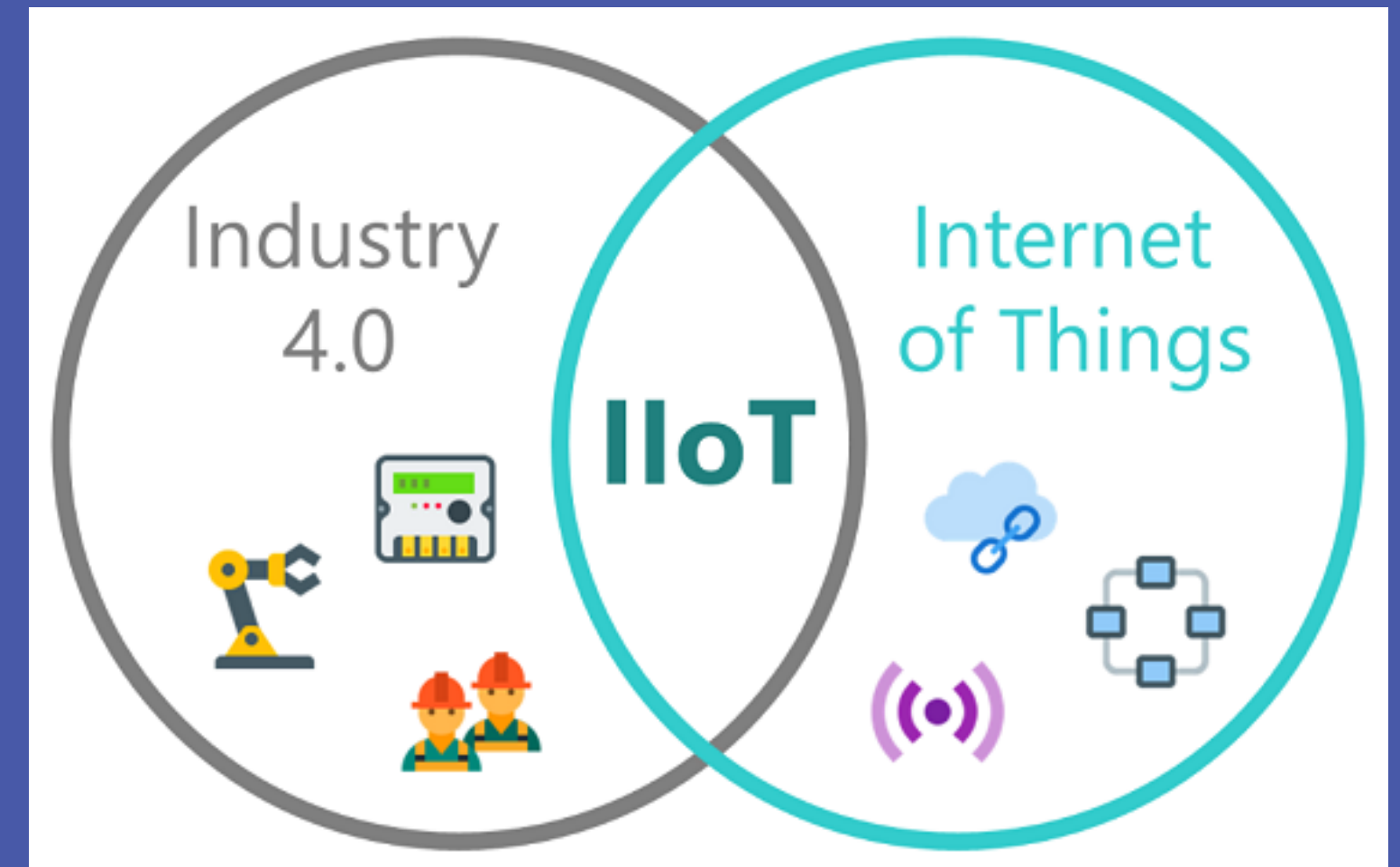
The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

An IoT ecosystem consists of web-enabled smart devices that use embedded systems, such as processors, sensors and communication hardware, to collect, send and act on data they acquire from their environments.



What Does IIoT Stand for ?

- The industrial internet of things (IIoT) refers to interconnected sensors, instruments, and other devices networked together with computers, industrial applications, including manufacturing and energy management.
- This connectivity allows for data collection, exchange, and analysis, potentially facilitating improvements in productivity and efficiency as well as other economic benefits



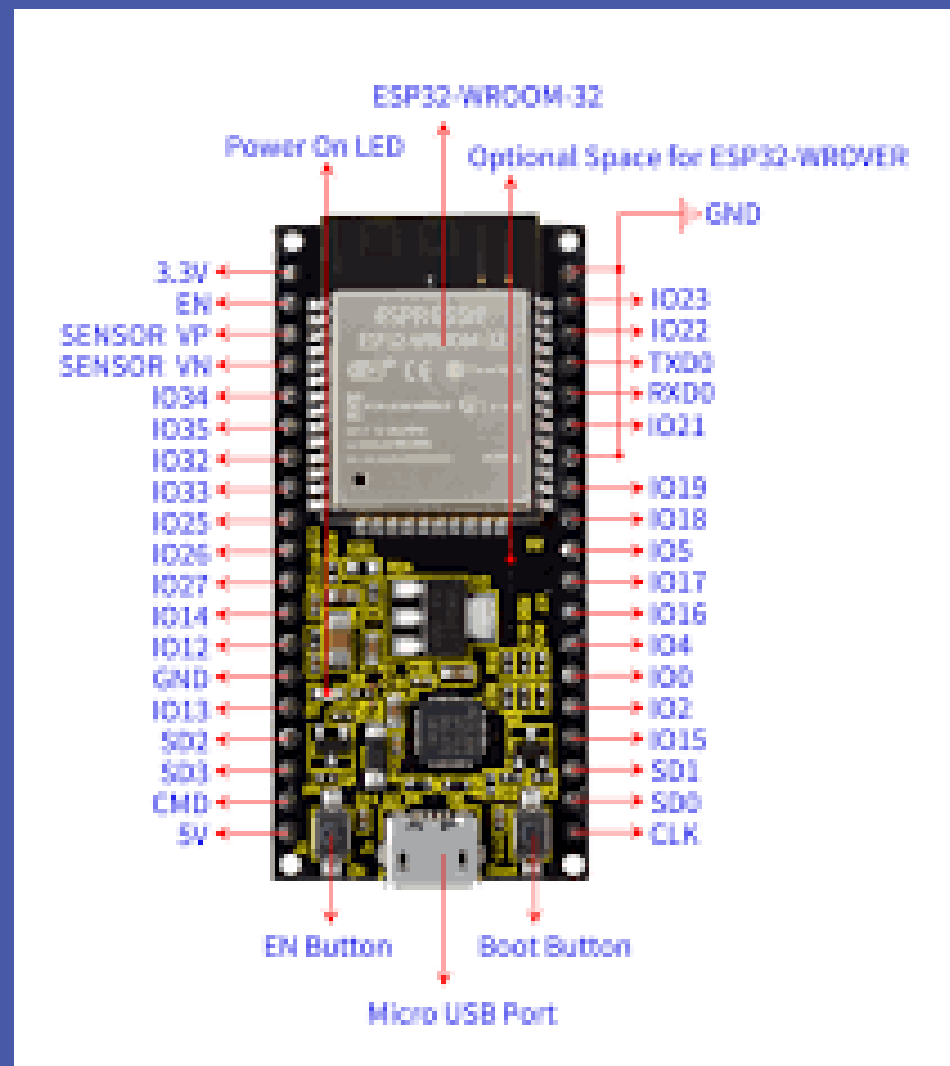
Augmented Reality

Augmented reality is a highly visual, interactive method of presenting relevant digital information in the context of the physical environment.

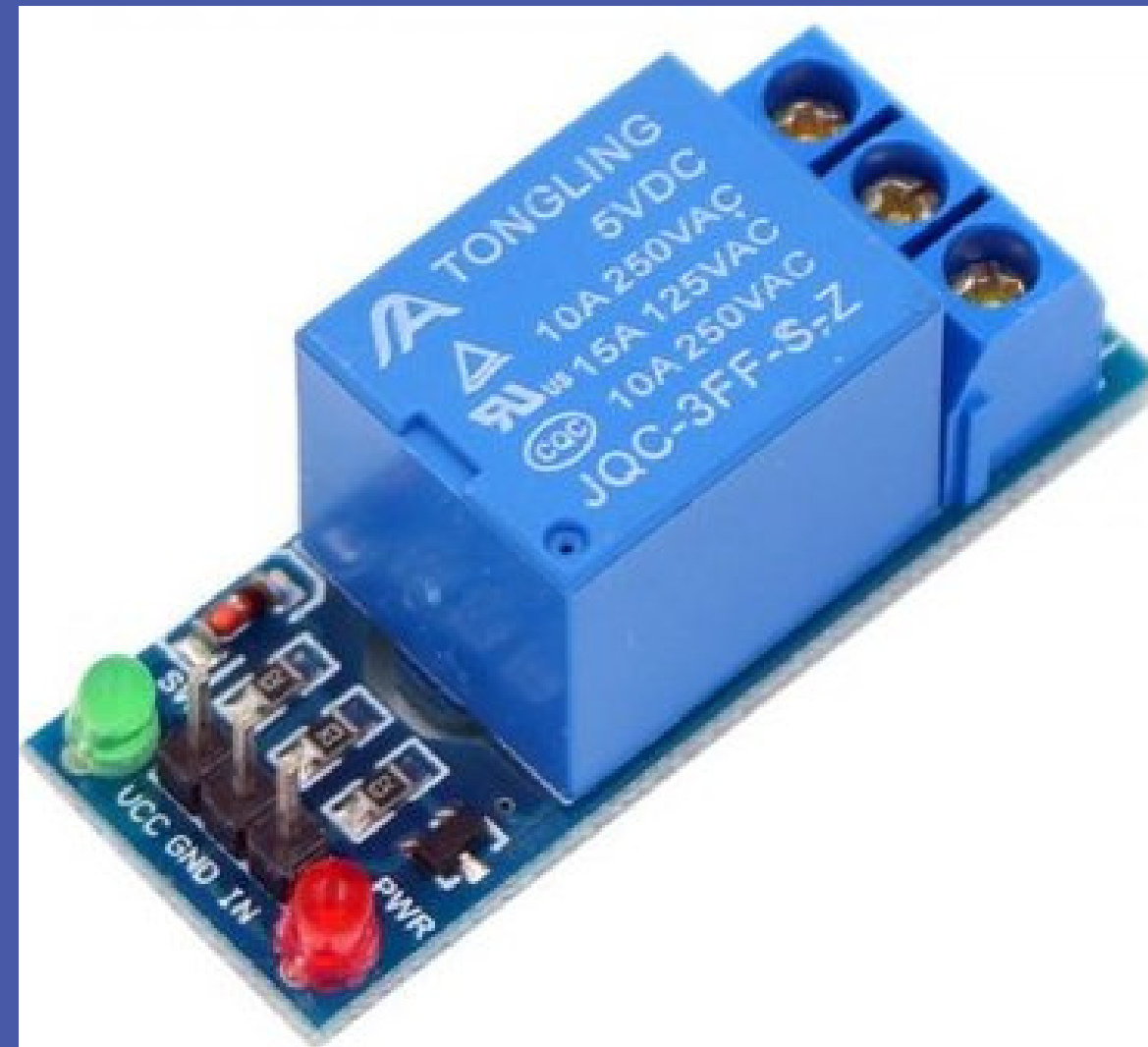
It consists of a set of technologies that superimpose digital data and images on the physical world.



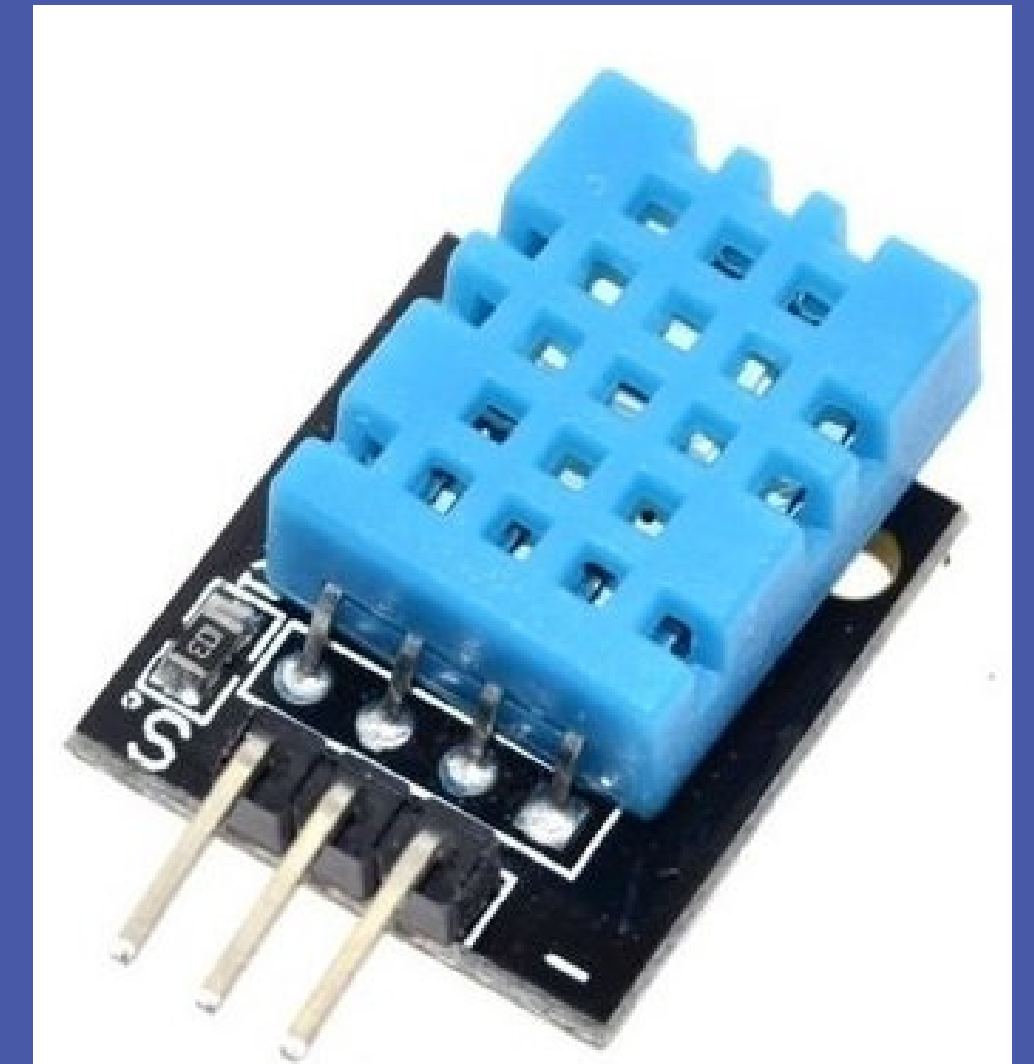
Hardware Components



ESP 32



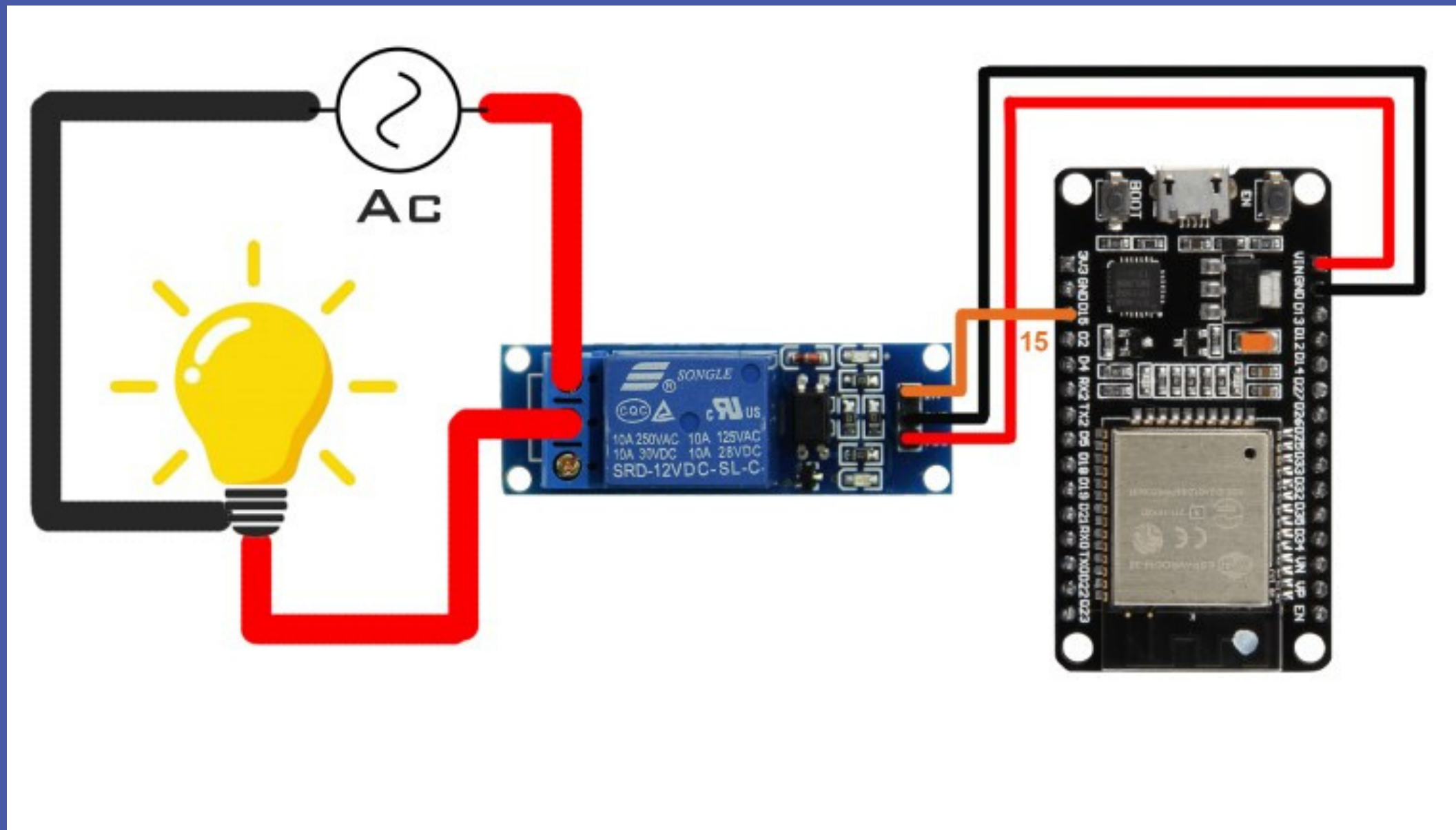
Relay Module



DHT-11

Schematics

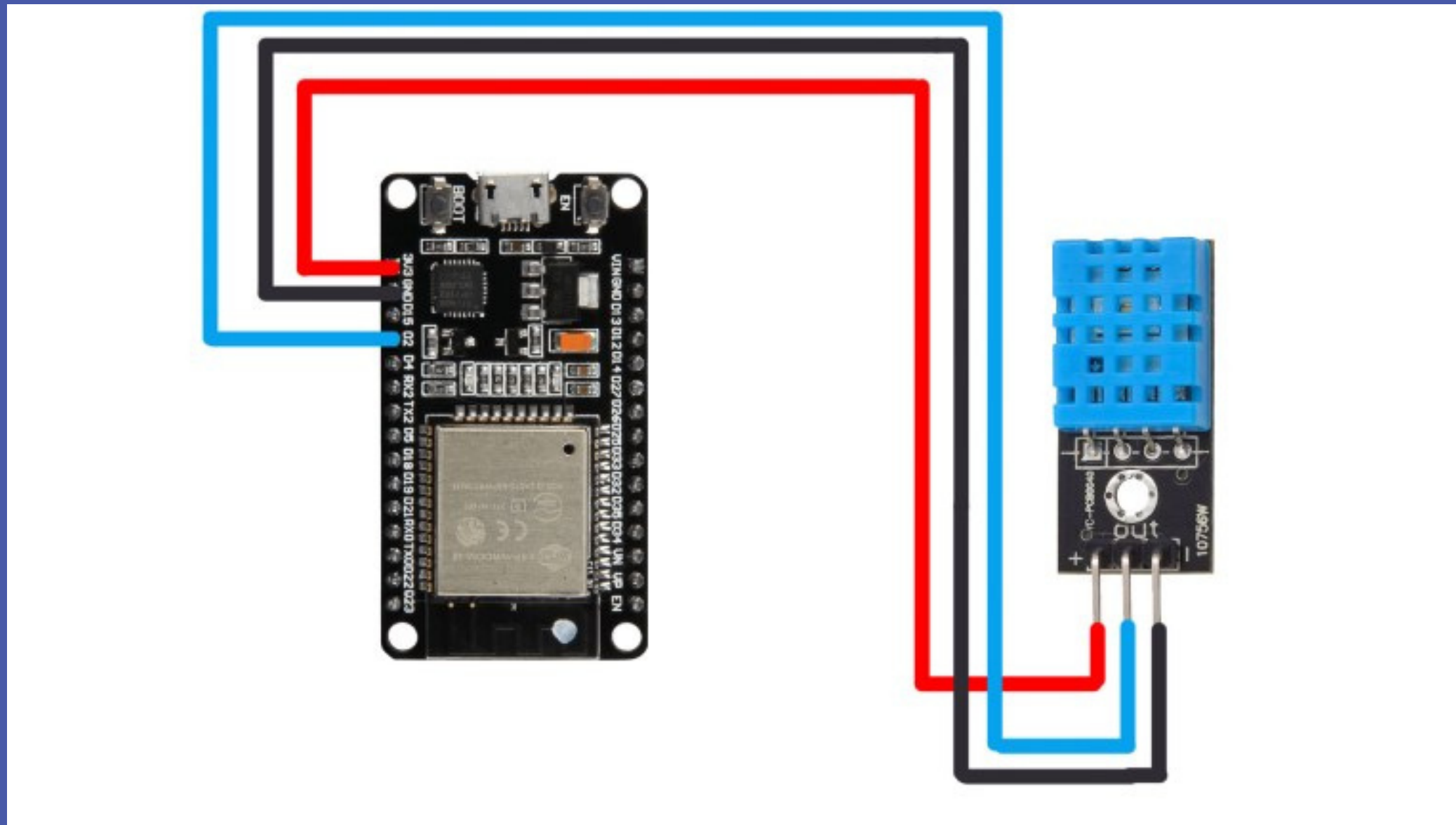
GADGET 1



- We can control any AC or DC device with this schematic design. The relay module is an electromechanical switch that turns on and off your appliances.
- Because the ESP-32 is a wifi-enabled microcontroller, it can be used to control equipment from any location on the planet.

Schematics

GADGET 2



- The temperature and humidity data from the DHT-11 sensor are sent to the ESP-32 in this schematic Diagram.
- Every 5 seconds, data about temperature and humidity is sent to ESP-32.

Software Requirements



Unity Engine

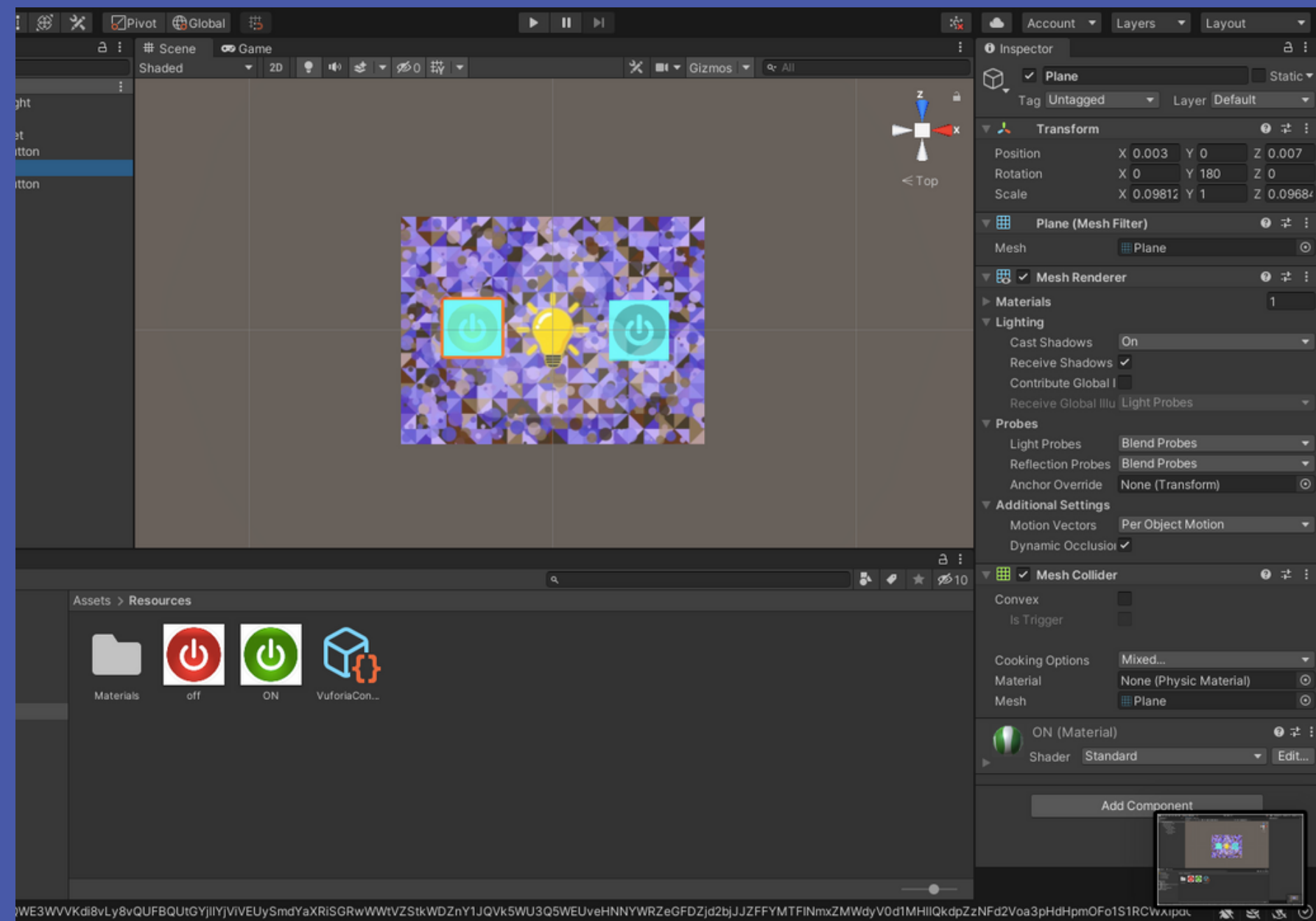
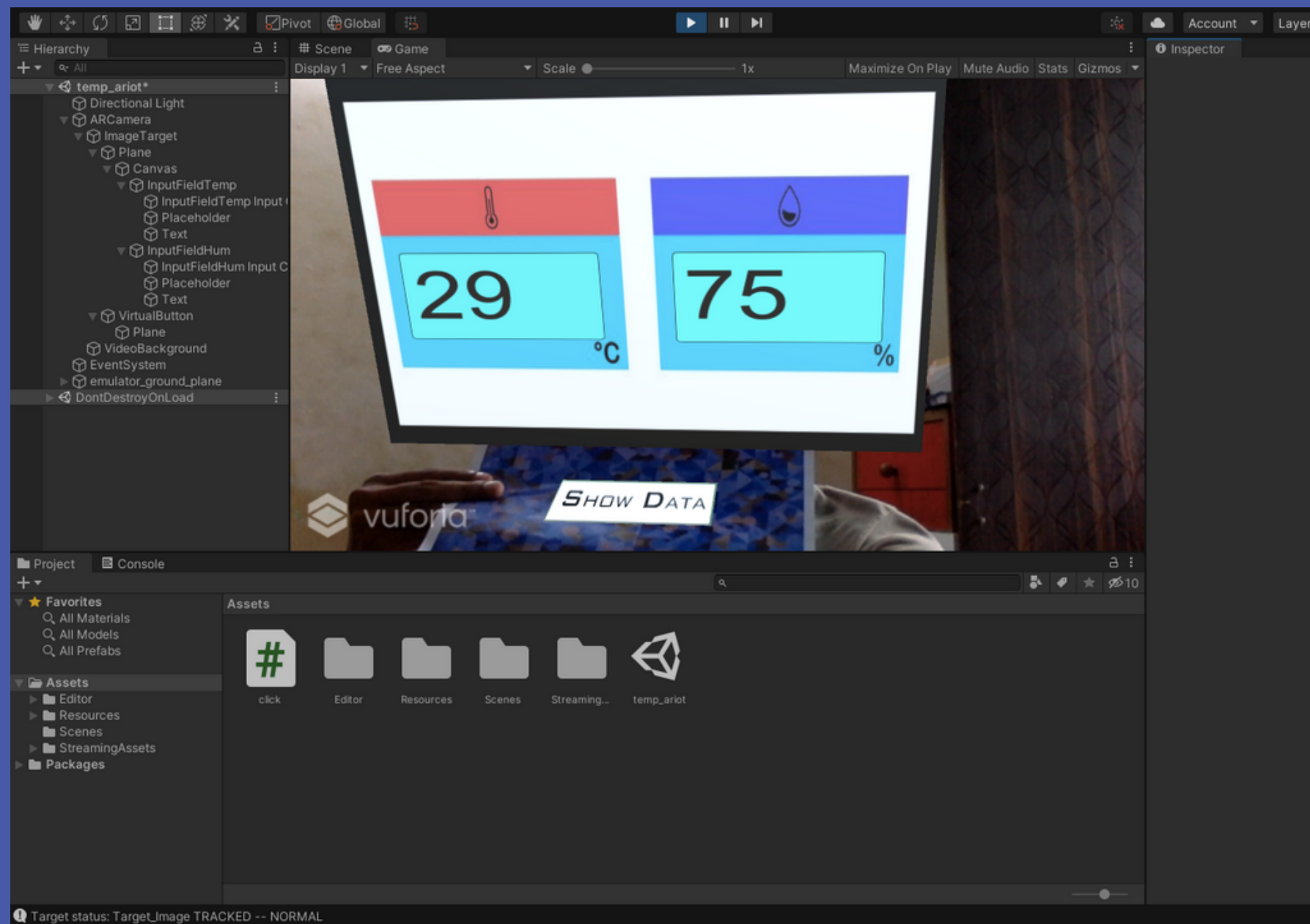


Vuforia Engine

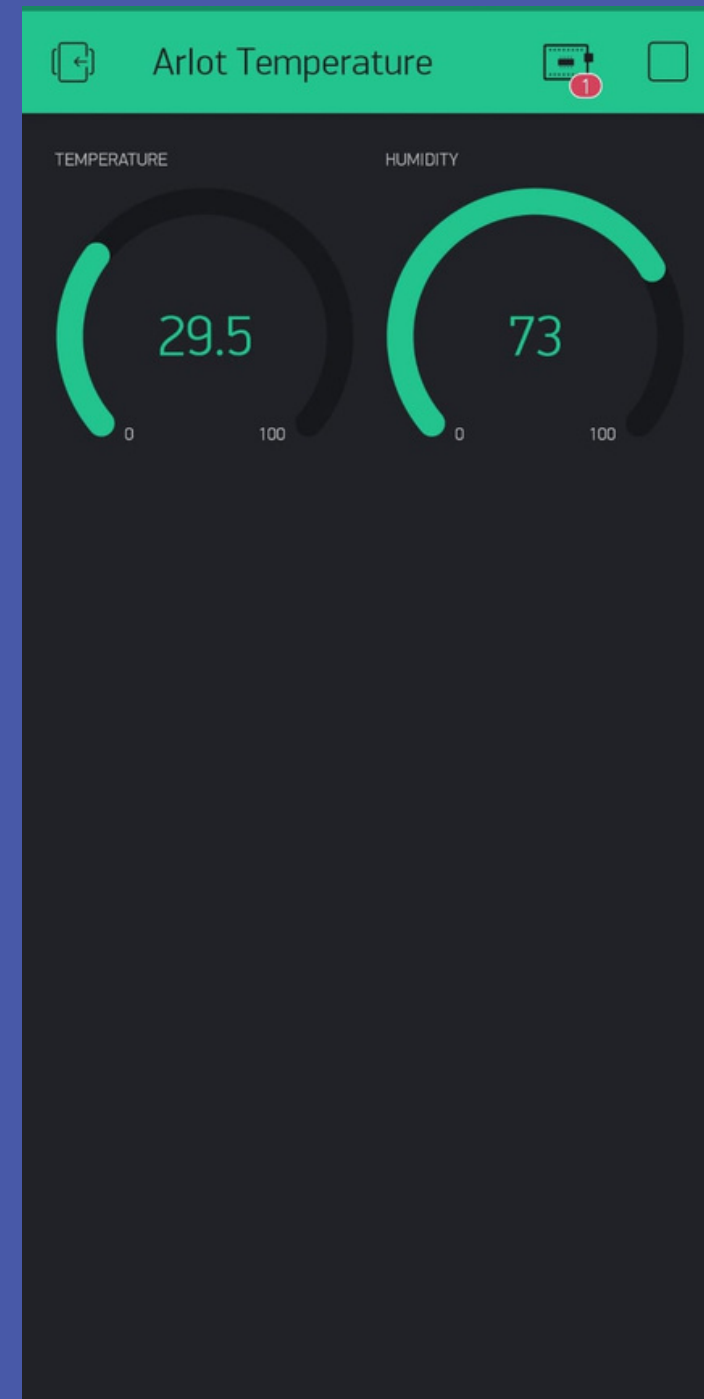


Blynk

Unity Engine



Application Programming Interface

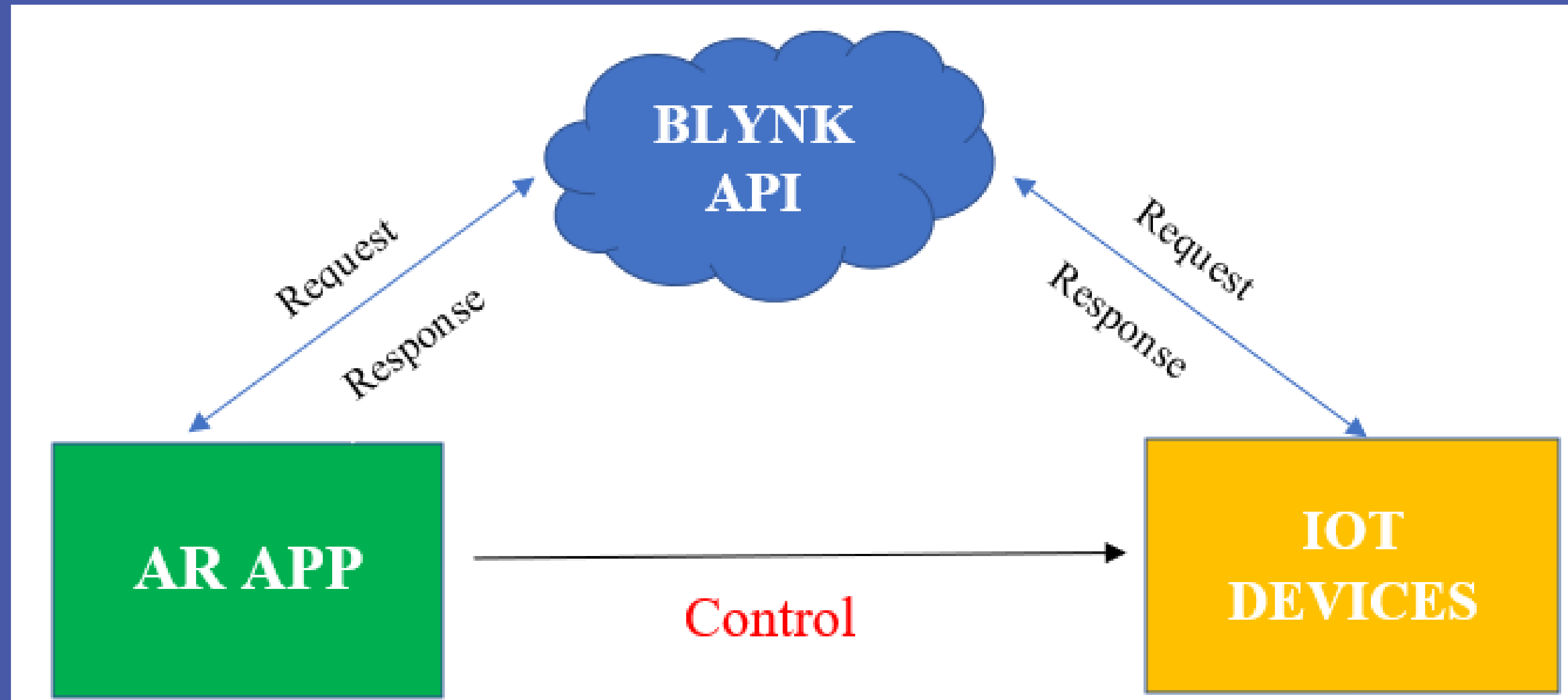


- **Blynk HTTP RESTful API** allows to easily read and write values to/from Pins in Blynk apps and Hardware (microcontrollers and microcomputers like Arduino, Raspberry Pi, ESP8266, Particle, etc.).
- Every **PUT** request will update Pin's state both in apps and on the hardware. Every **GET** request will return current state/value on the given Pin. We also provide simplified API so you can do updates via GET requests.

Demonstration

**[https://drive.google.com/f
ile/d/17R5MgyvqhfbpG-
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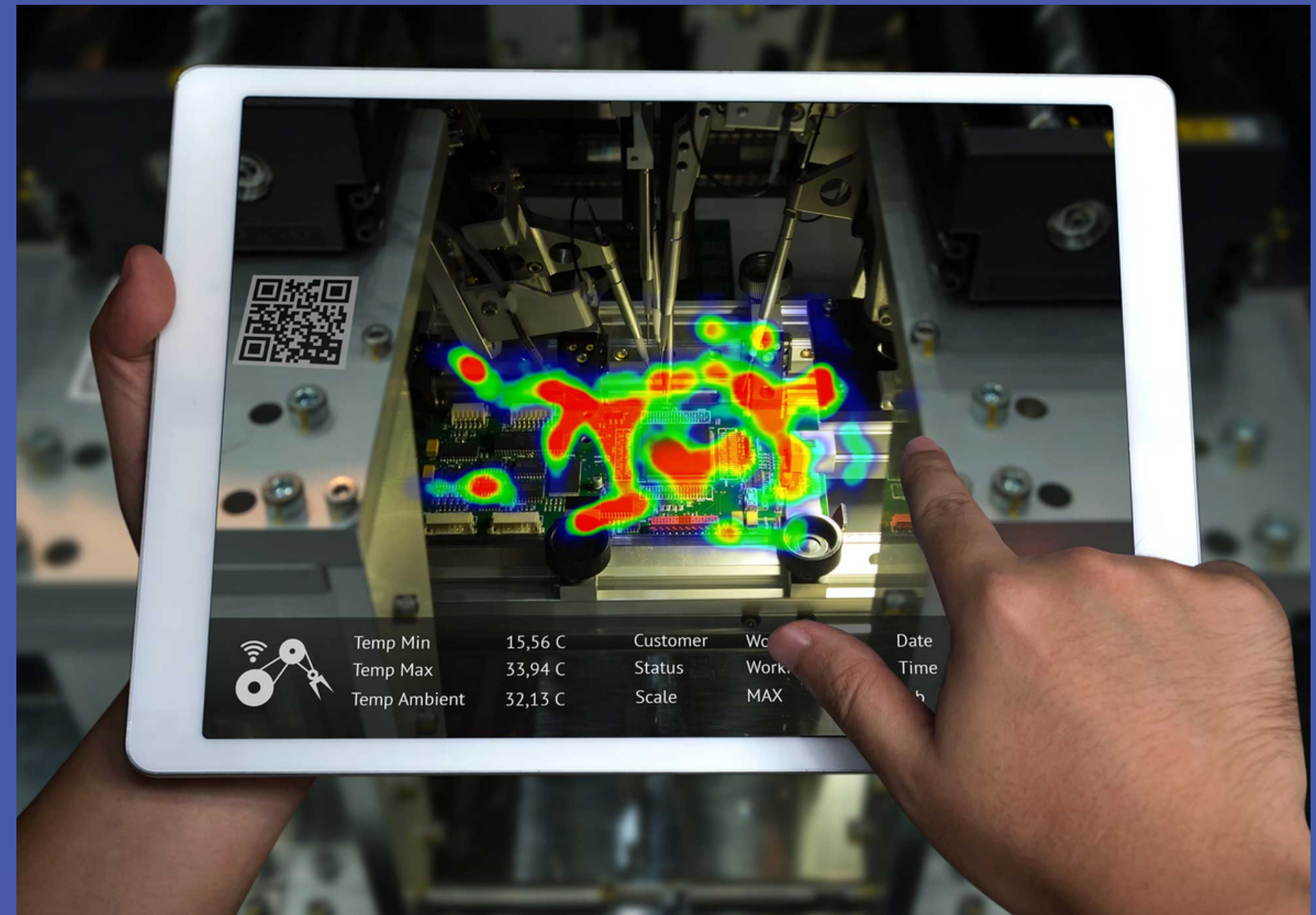
Flowchart



Future Scope

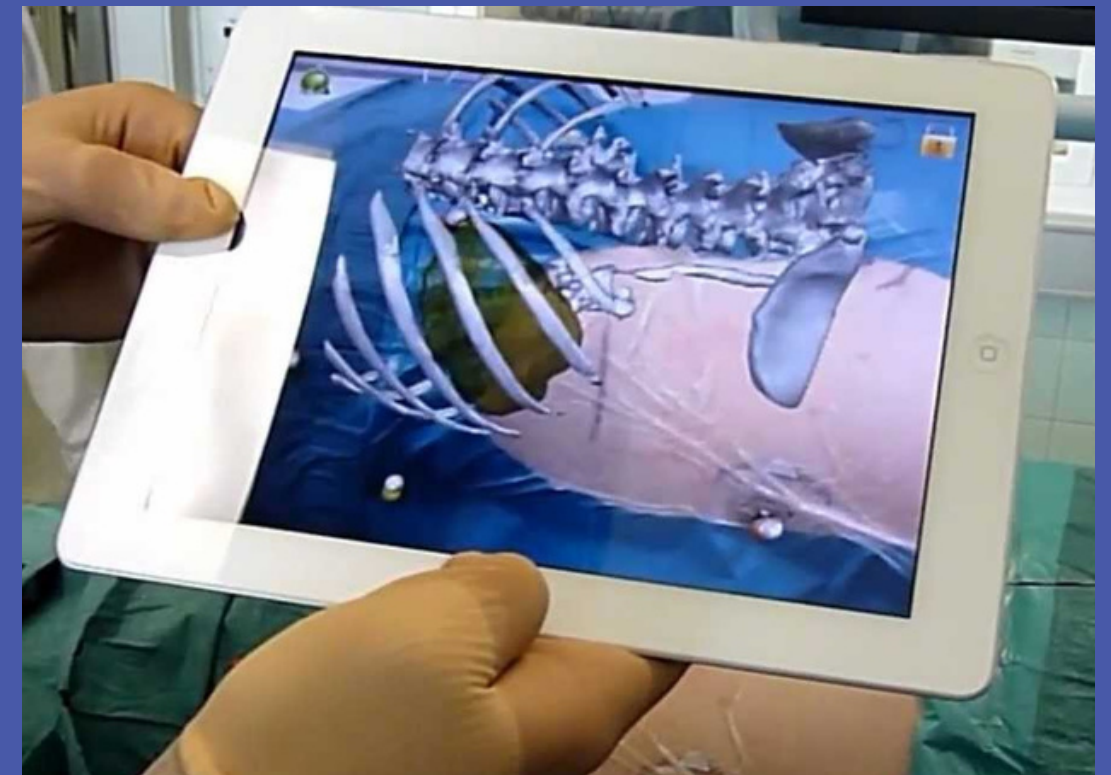
We intend to develop a mixed reality integrated solution for the automation and manufacturing industries.

This concept will aid workers in emergency circumstances and help them be more efficient in their daily activities.



Applications

- Used in Automation and Manufacturing Industries.
- Detecting and Preventing Pump Failures
- Visualizing Product Design in Business.
- Used to Make Medical Education Interactive.
- Monitoring Crops and Farm Vehicles.
- Gaming and Entertainment.



Thank You