The chair of hope system

Supervisor: Dr.Anas Toma

The Team

AND

Raghad Marie

Rose Brakat

The devices that a person with paraplegia uses them most of his time

the chair

the stair

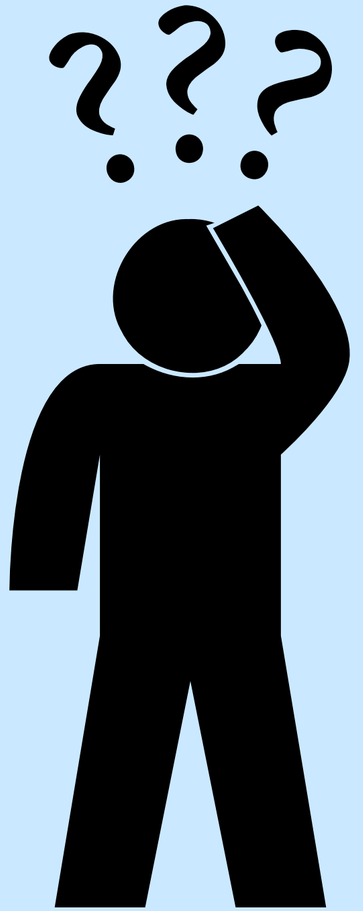
the house and its devices

the phone

Why we need this project ?

48.4% of the total number of people with special needs in the Palestinian Territories are those with movement disabilities, so the idea came when we see this group in our society suffering from many things.

so can we provide a safe and easy environment for them from this category and specifically paraplegia? because the traditional wheelchairs don't provide that and there is an urgent need to find innovative solutions to help them.



Literature review

There are new types of wheelchairs which it can dealing with stairs through an elastic belt that has a strong cohesion with the ground and allows movement in the same time.

- For example, Dragon chair which was named "Stair climber" it helped people using the stair, but there are still signs of dependence on others (it required someone else to help them), and it is not safe relatively.
- Then it appeared improved chair with the same idea (using the belt) but it controlled by himself without need someone else, and there is a controlled joy steak to balance the seat during using the stair.

Dragon chair

Stair climber

The Methodology of the work

we decided the idea

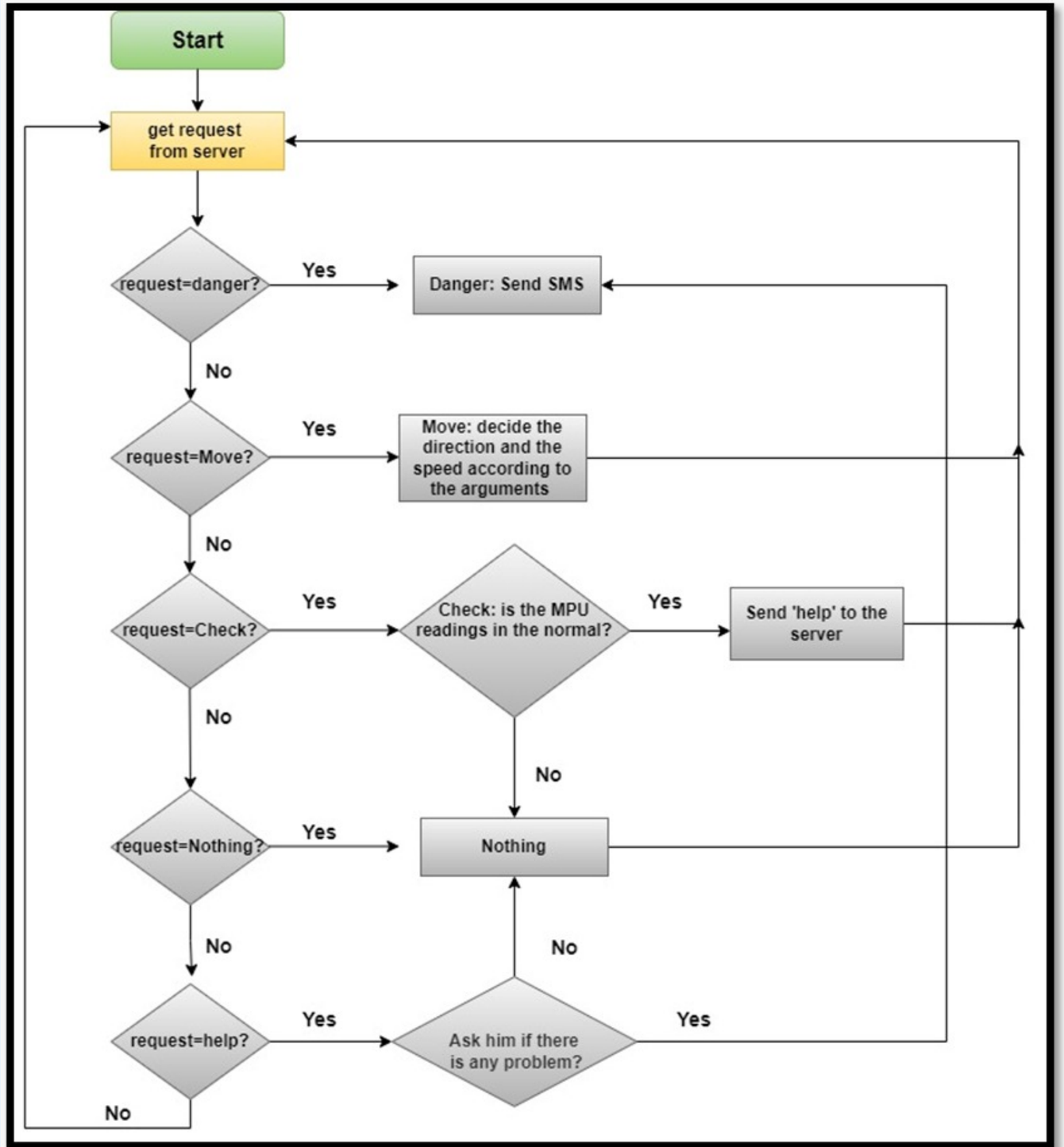
we searched for similar projects and information in the same field

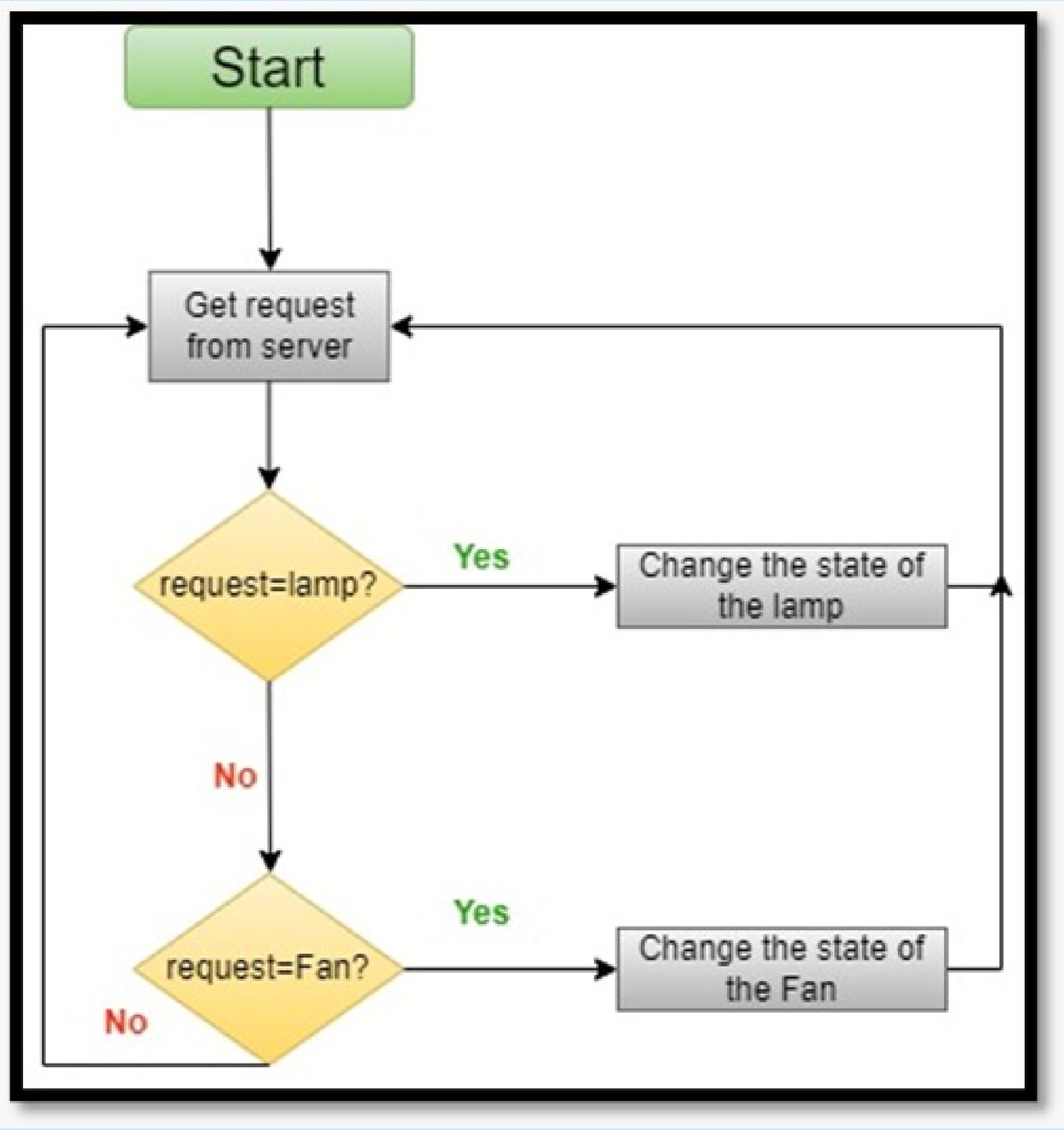
we chose the components that we used in our project then understod how they works

We used app inventor to design a mobile application works using WI-FI technology

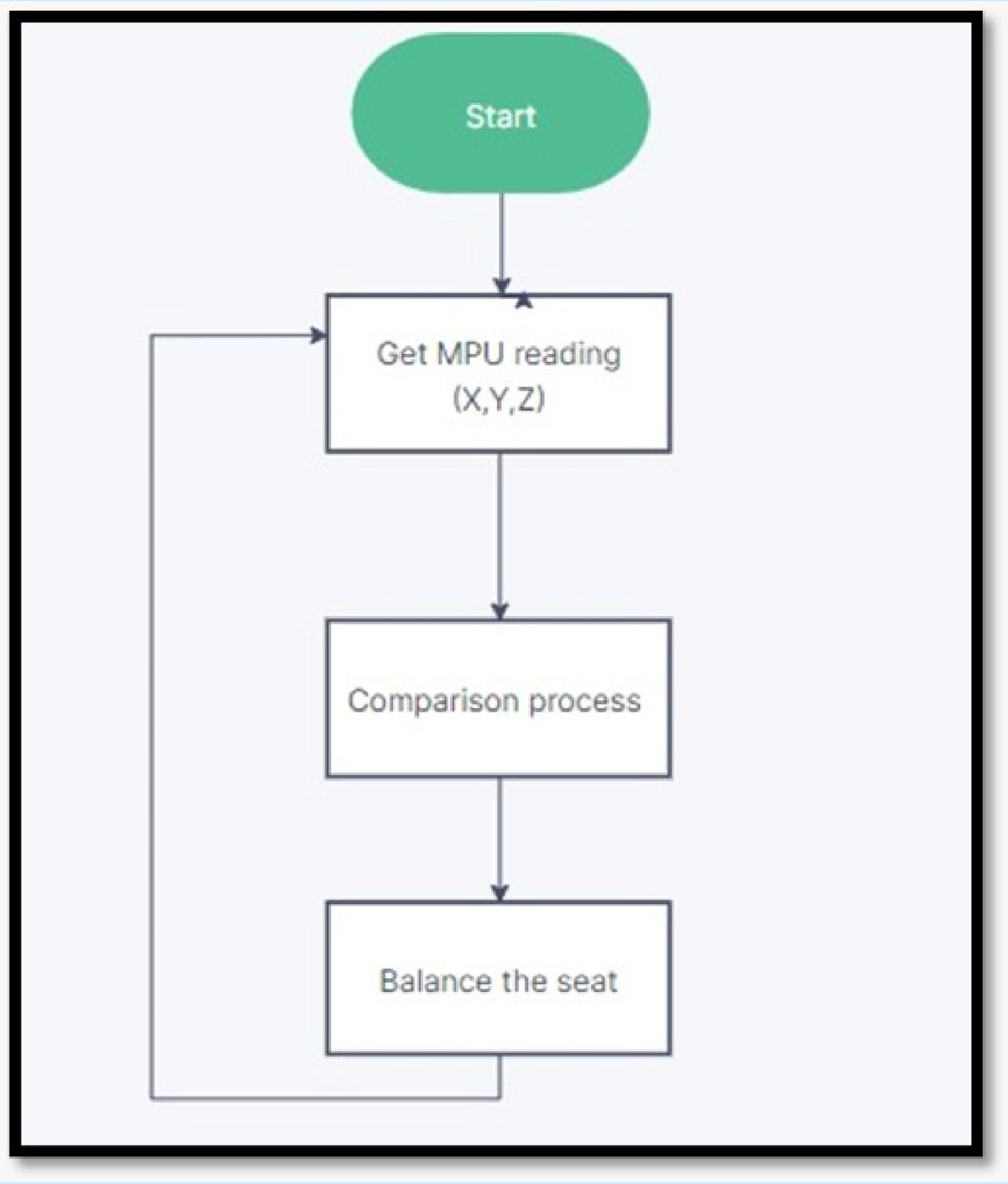
We designed a chair model using a children's toy, a small house model and a stair model

Methodology of the system:



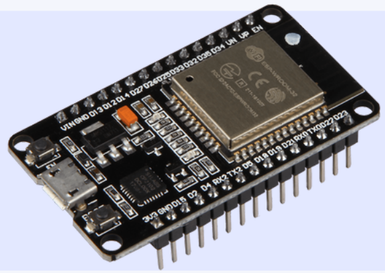
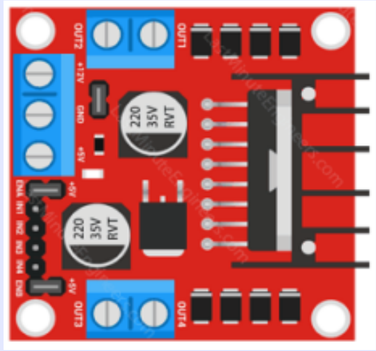


The home

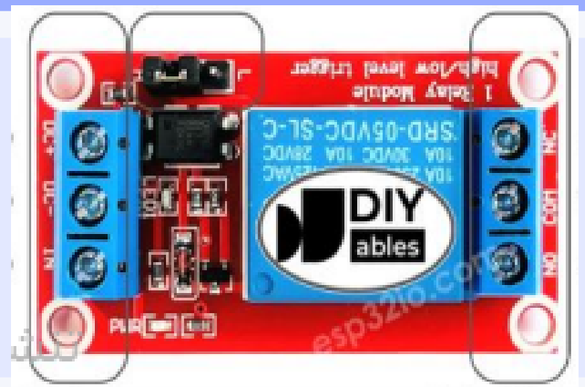
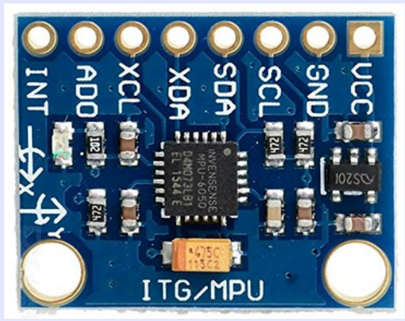


How the MPU6050 works

The components:

Name	image
ESP 32	
SIM808 GSM/GPRS/GPS Module	
L298N DC Motor Driver Module	

The components:

Name	image
- 5V CHANNEL RELAY MODULE ACTIVE HIGH/LOW	
MPU6050	
12V DC Linear Actuator	

The components:

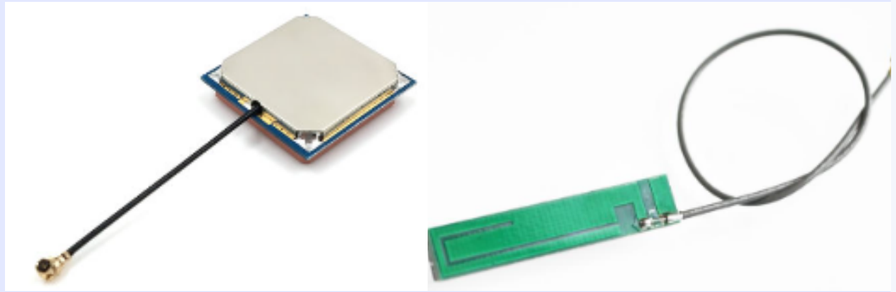
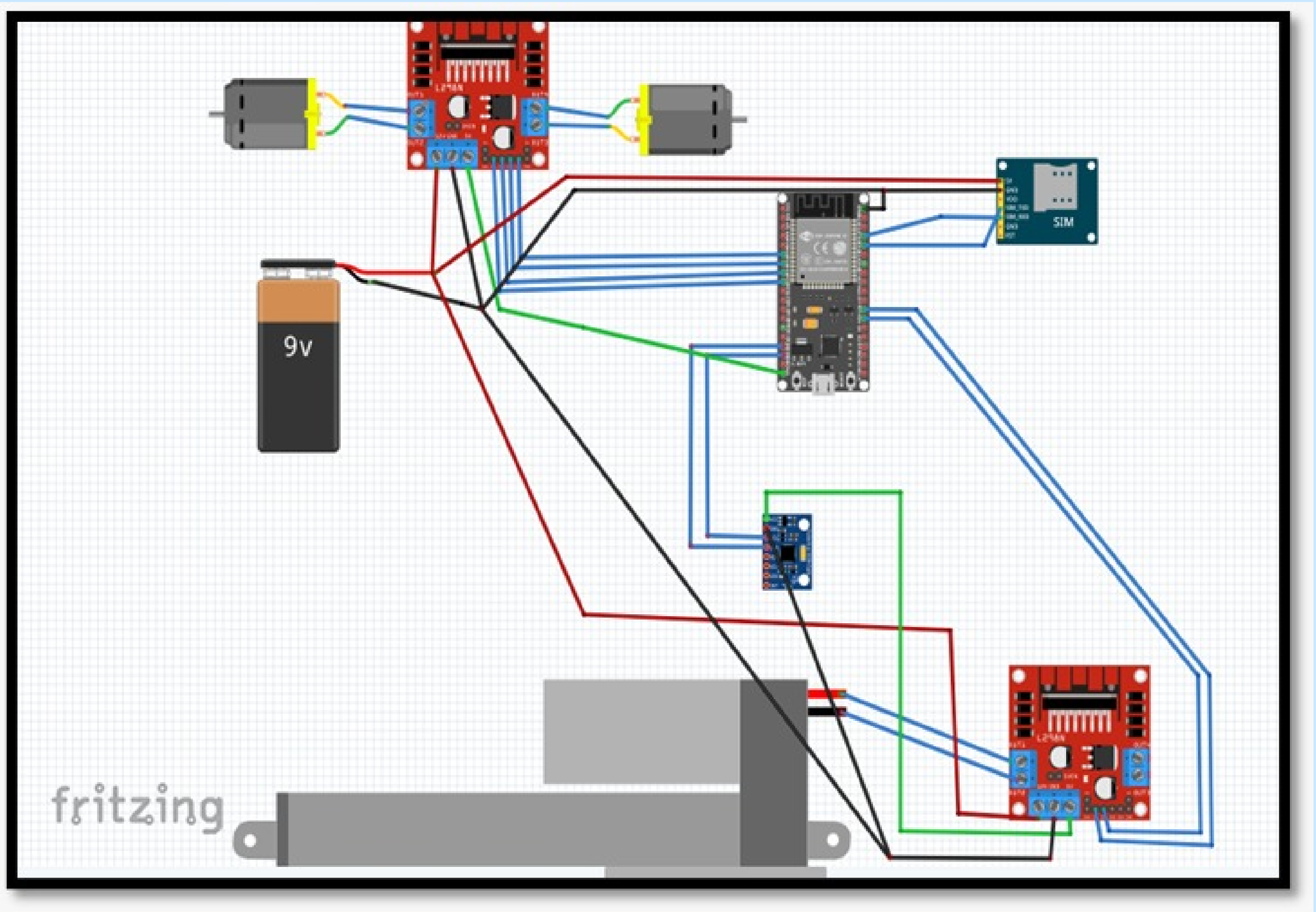
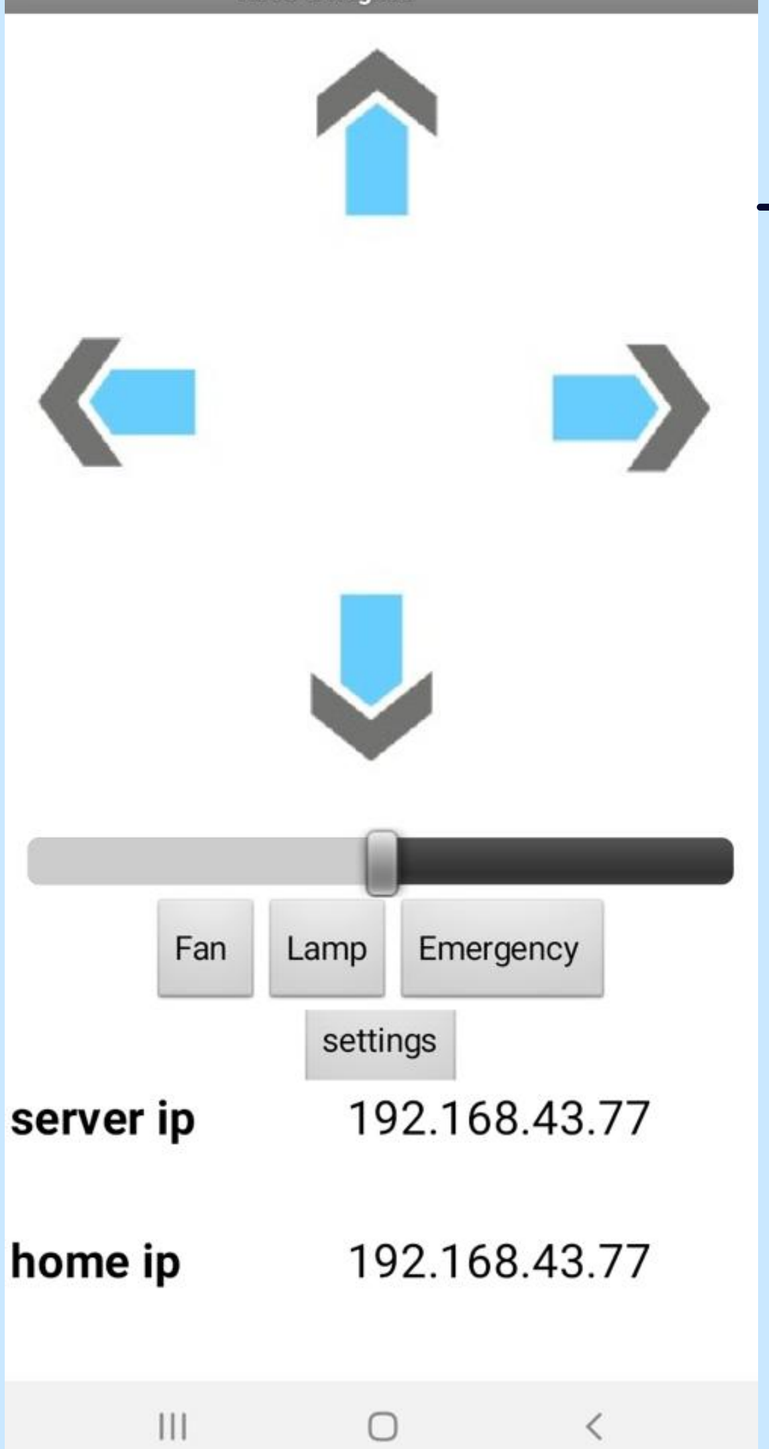
Name	image
12VDC LED STRIP	
12V DC COOLING FAN	
Antenna for GSM/GPS	

Diagram shows how the components are connecting



Results and discussion

In the end, after our journey in this project, the project worked as expected and planned. It works correctly .
we tested all the features that we put on the system, and we were able to design an ideal and more advanced chair than the previous chairs and reduce dependence on others significantly.



The system does the following:

First: The application which we created through App inventor.

It contains:

1- 4 Buttons for the movement of the chair in all directions.

2- Slider to control the speed for the chair.

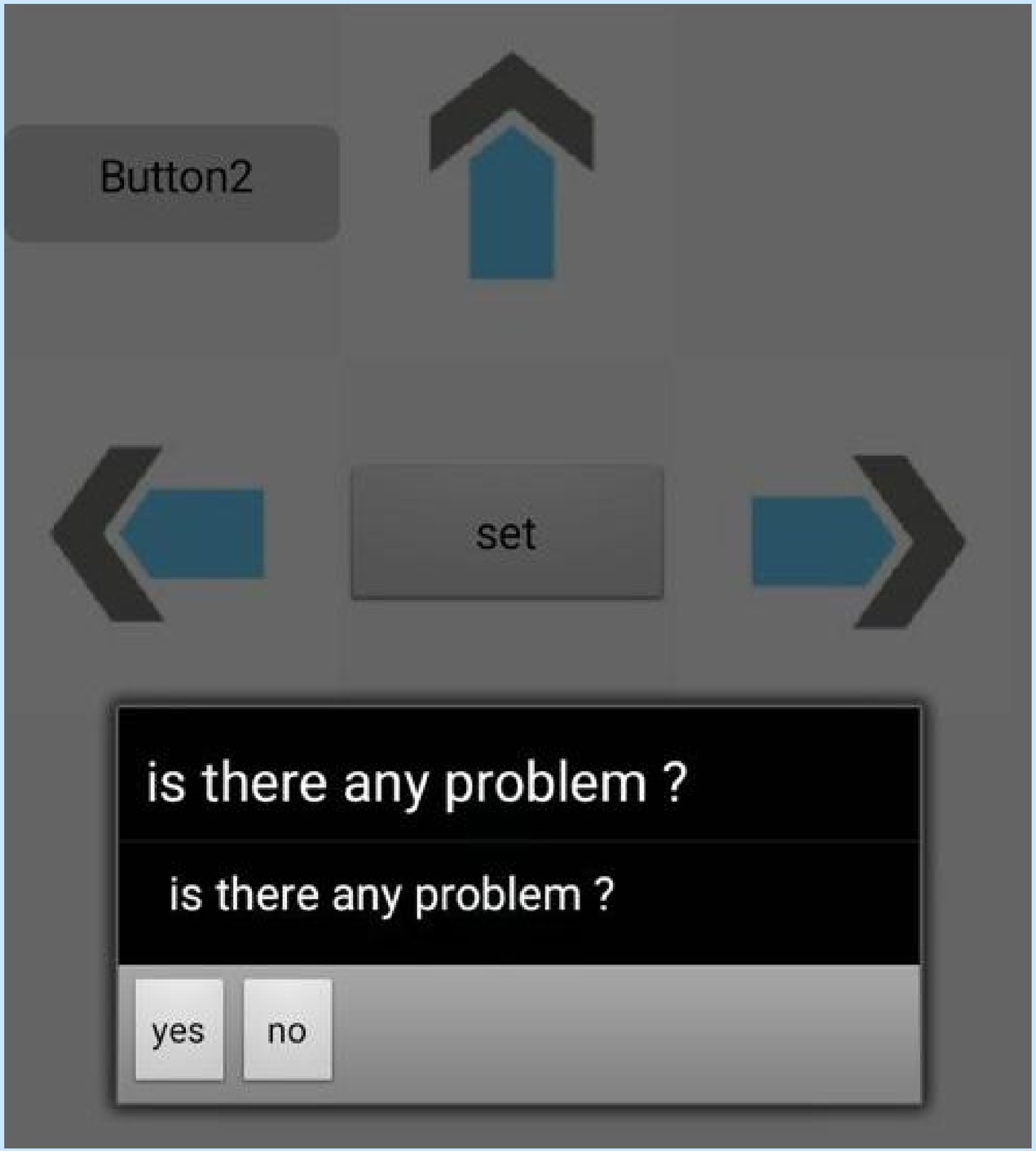
3- Button for the emergency state to send SMS message to one of his family.

4- Buttons to control a Fan and Lamp.

5- Setting Button to choose the Ip addresses.

Second: The chair is able to climb up and down the stairs using the model that we brought

The chairs' seat can balance while climbing the stair, this point provide safety while
using it, it Keep the person in a state parallel to the straight floor.
And most importantly,
it is automatic using the sensor MPU6050.



Third: If there are abnormal readings From the MPU6050, Notification appears in the application with sound asking the person if there is a problem.

Thank you