

IR Based Lift Control System

Team Members

Shashank
Tannu
Giridhar
Vennela
Vardhan

#Smart lift

Outline

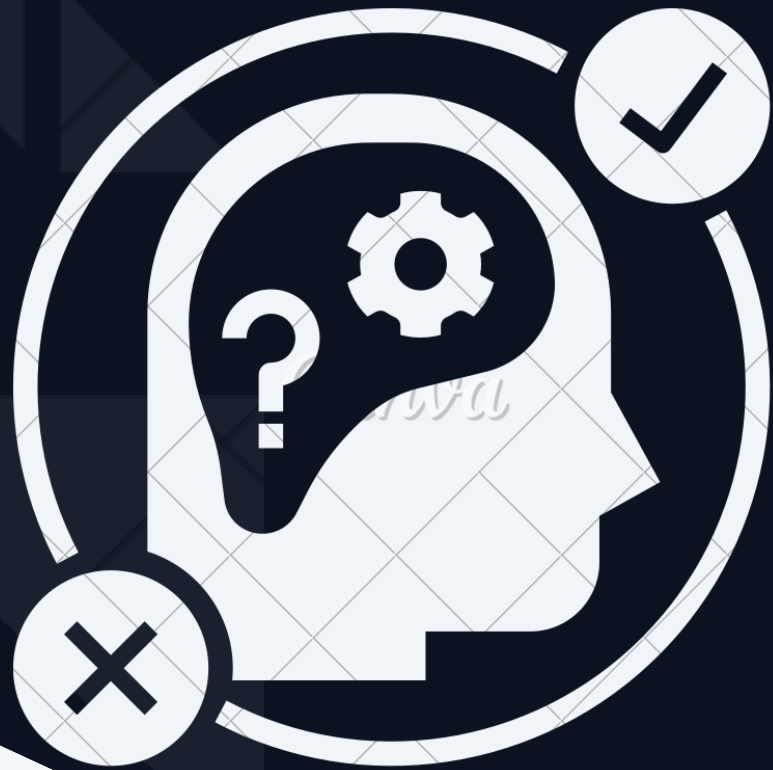
- Features
- Motivation
- Components
- Methodology
- Conclusion
- Future scope

Features

Some key features of smart lifts, such as:

- Intelligent destination control
- Energy efficiency and sustainability
- Integration with smart building technologies
- Time saving

Motivation



Energy and time are the two most precious resources in today's scenario and they need to be managed and conserved effectively.

Our project focuses on reducing waiting times, minimizing energy consumption, and increasing the overall efficiency of vertical transportation.

By analyzing the signals from IR Sensors and usage patterns, our smart lift can adjust its routes.

Components



- Nemma 17 Stepper motor -1
- Threaded rod - 1 and 2 ball bearings
- Cylindrical rod - 2
- PLA or ABS material for 3D printing
- TB6560 Stepper driver -1
- Arduino Mega -1
- Flexible wires
- Thermocol
- Foam PVC sheets

Components Continued...



- IR sensors compatible with arduino-4
- Wood platform for base
- Wood for lift
- Push buttons
- LED
- SMPS power supply of sufficient rating
- Veroboard Or board for PCB like purpose
- Breadboard for making the driver connections and jumper wires
- Servo Motors

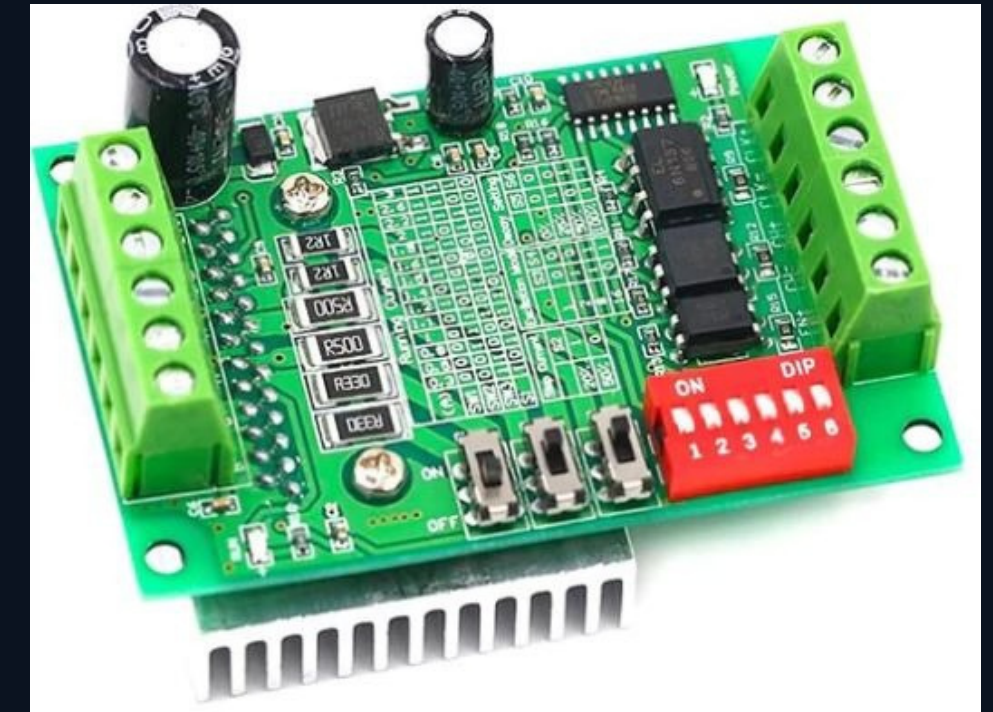
Methodology

1. The lift mechanism is inspired by the working of 3 D printer, we will use a threaded rod, a cylindrical rod, 2 ball bearings and the component connecting these 2 rods will be 3 D printed.



Methodology

2. The rods are connected to a stepper motor which will be driven by a stepper motor driver, here the microcontroller is the brain which will power the motor and also the LEDs.

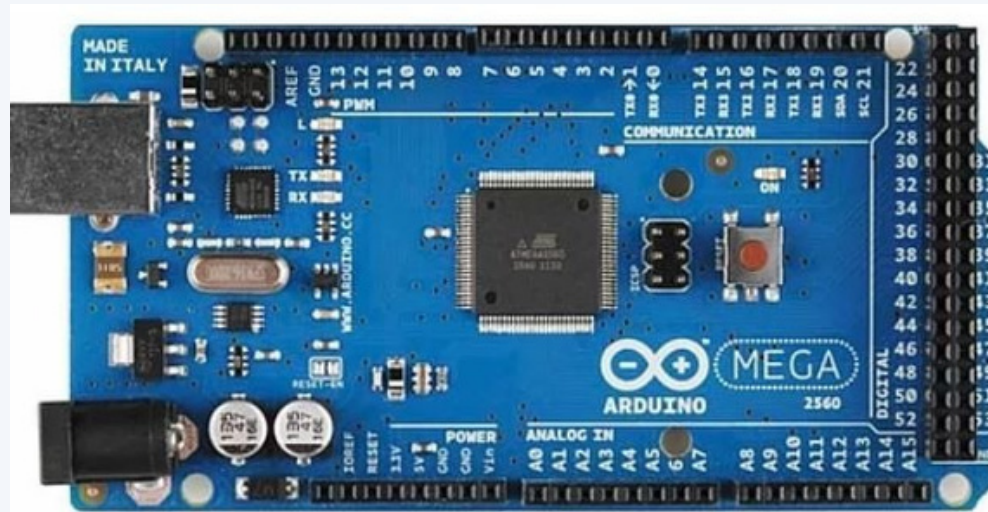


Stepper Driver

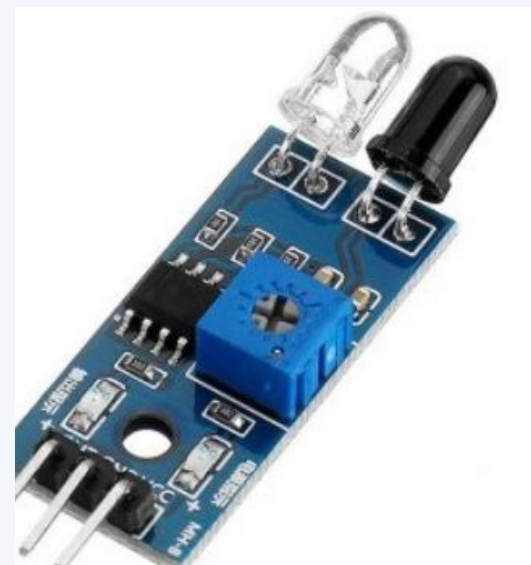


Stepper Motor

Methodology



Arduino Mega

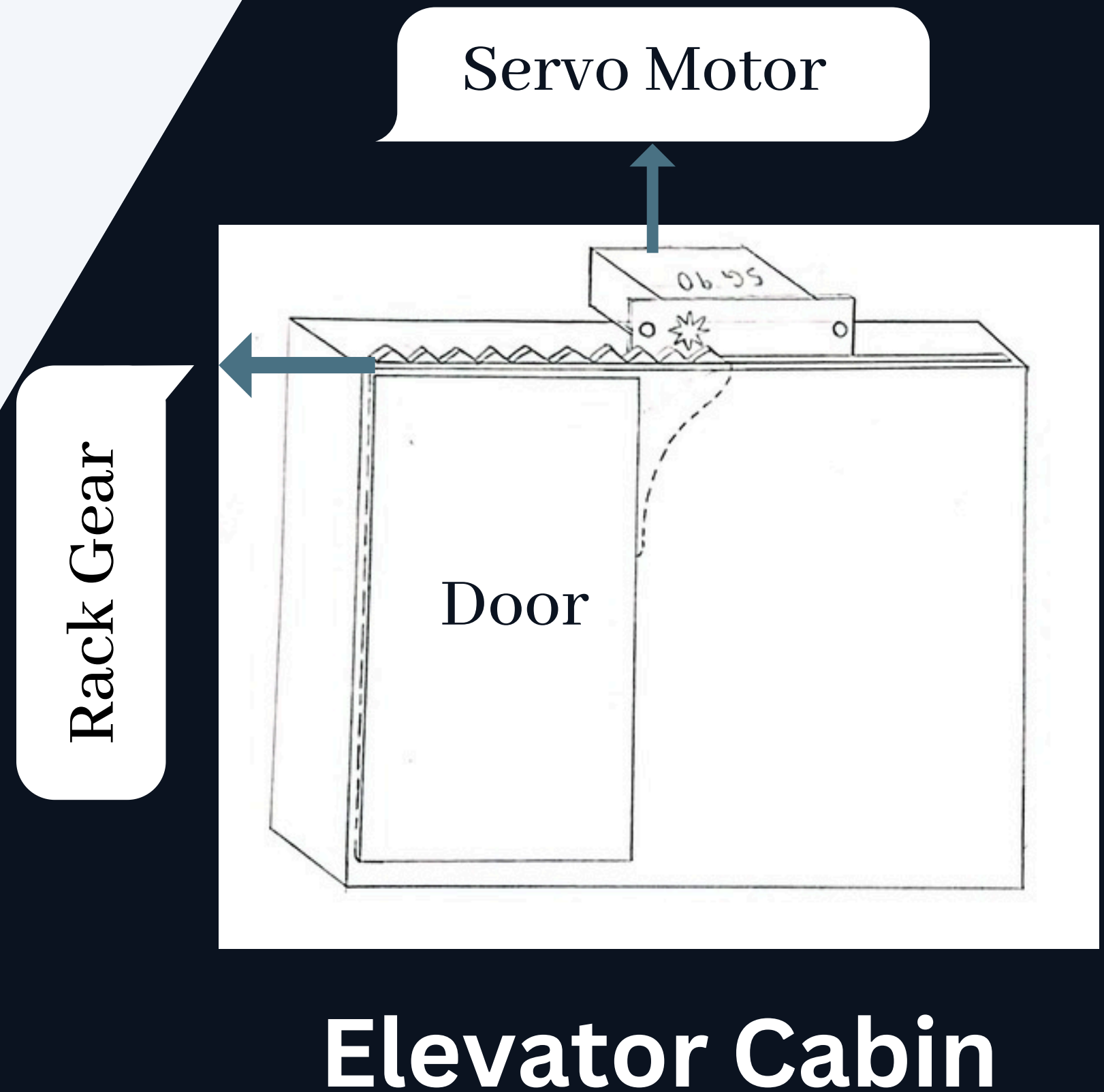


IR Sensor

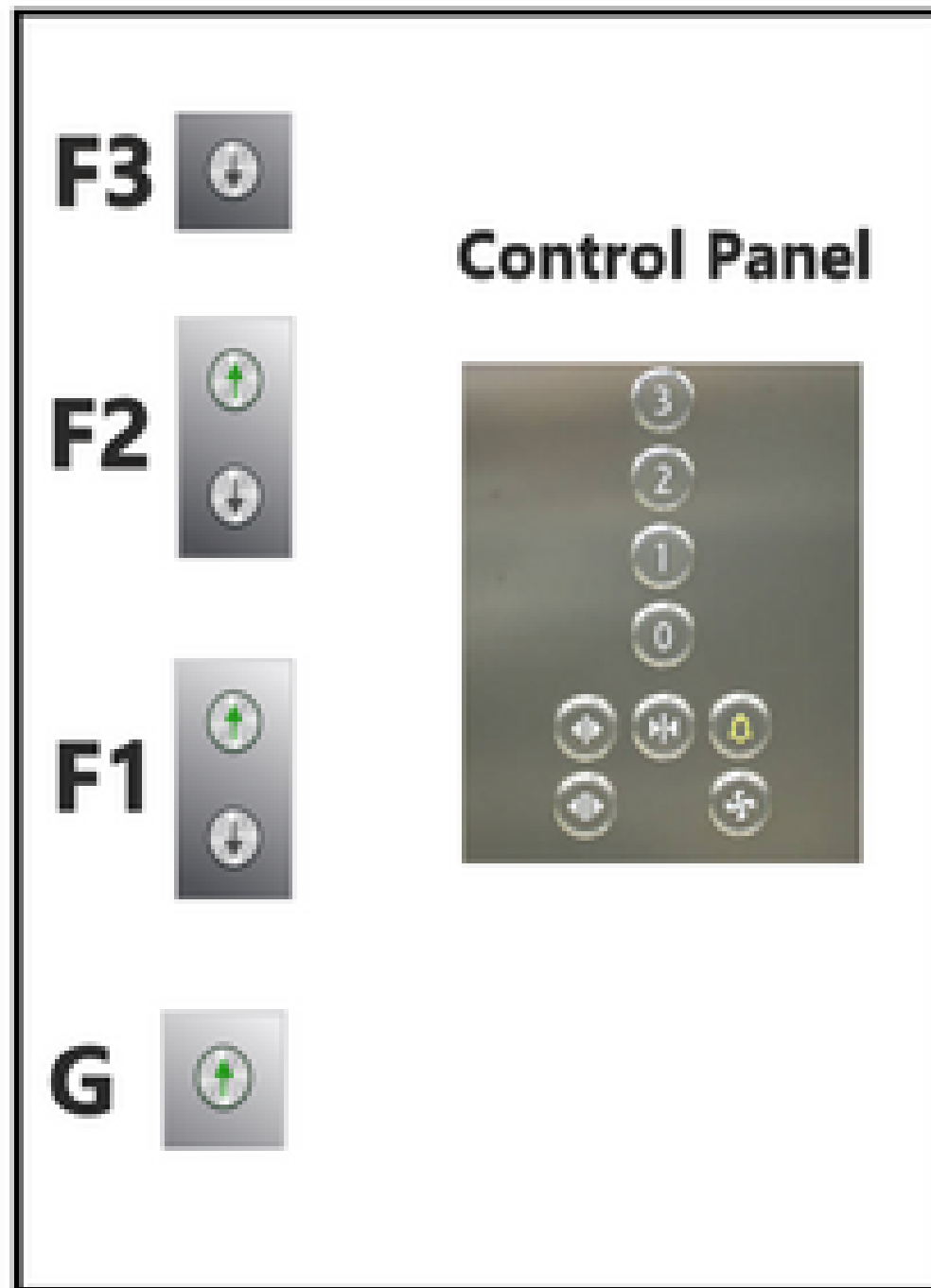
- 3.** We will install IR sensors on each floor, when someone will push a button on some floor then the microcontroller will start collecting the data from the IR sensor of that particular floor, as long as it detects someone the lift will move towards that floor and if the person leaves then the detection will stop and the lift will stop at the nearest floor.

Methodology

4. A servo motor will be driving the door which will be mounted on a rack gear, if the person leaves after the lift arrive on the floor then the door won't open.



Methodology



5. The push buttons will be separate from the lift setup, arranged on a horizontal dashboard bcz of size constraint, we can call and send the lift on different floors using these buttons.

Learning Opportunities

By working on this project, the students will come to know about,

- The use of different electronic parts like sensor, microcontroller etc and the art of connecting them all together,
- The working of stepper, servo motor and respective drivers
- Different skills like 3 D printing, working with PVC, and machines like bandsaw, tablesaw etc.
- We will provide code templates to the students so that they need not worry about that and can focus on learning about the components in a way so that they can use them for new innovations.

Future scope

Implementation of model in real life

- Using PIR sensors instead of IR sensors,
- Better energy conservation by connecting the light and the fan inside the lift with the motion detecting sensors to turn them on and off automatically
- We can integrate all these parts by connecting them to the lift control system.





Thank You
For Your Attention