MAGIC FRAME
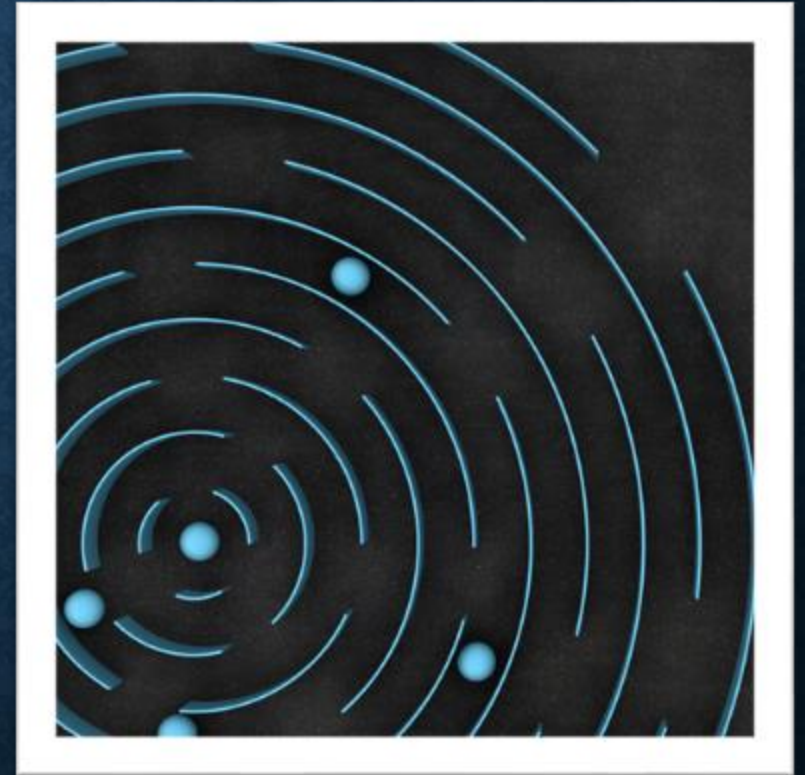
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ABSTRACT/INTRODUCTION

- **Magic frame** is a simple frame which has the ability to transform a normal screen into a digital touch screen area.

- It can be connected to any computer, which could be a laptop or a Raspberry Pi with a USB port.

- It is incorporated with a TOF10120 sensor which is mounted on a servo motor which oscillates repeatedly over time.

  - It works by illuminating the scene with a modulated light source

  - The phase shift between the illumination and the reflection is measured and translated to distance.

MATERIALS REQUIRED

- Arduino
- Type B connector
- Jumper Wires
- Servo Motors
- Breadboard
- TOF10120 Sensor
 **Hardware:**
- Acrylic sheets for Laser Cutting

METHODOLOGY

❑ Several mechanisms were devised to get the desired product. It was finally concluded to go with the Time of flight sensor.

❑ The sensor was mounted on the servo, its rotation gives the angle and sensor reading gives the distance.   `

❑ The distance and the angle are then feeded into a Python program which converts it into x, y coordinates. The cursor then traverses as per the touch movements.

❑ The connections were completed and readings were communicated from Arduino to Python serially.

❑ The hardware was modeled and laser cut to fit the screen as per our requirements.

❑ The components were assembled, and our model is ready to be deployed.

RESULT
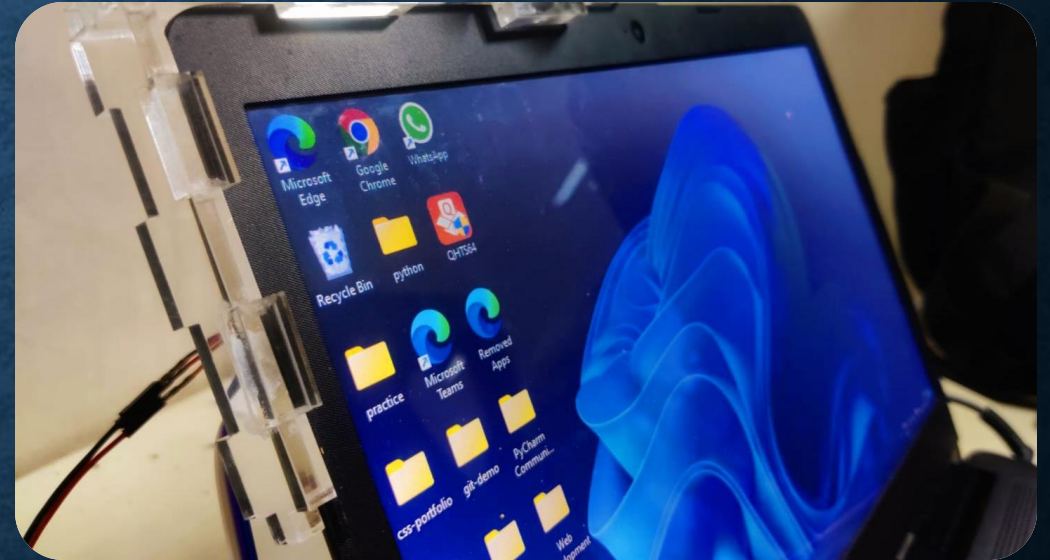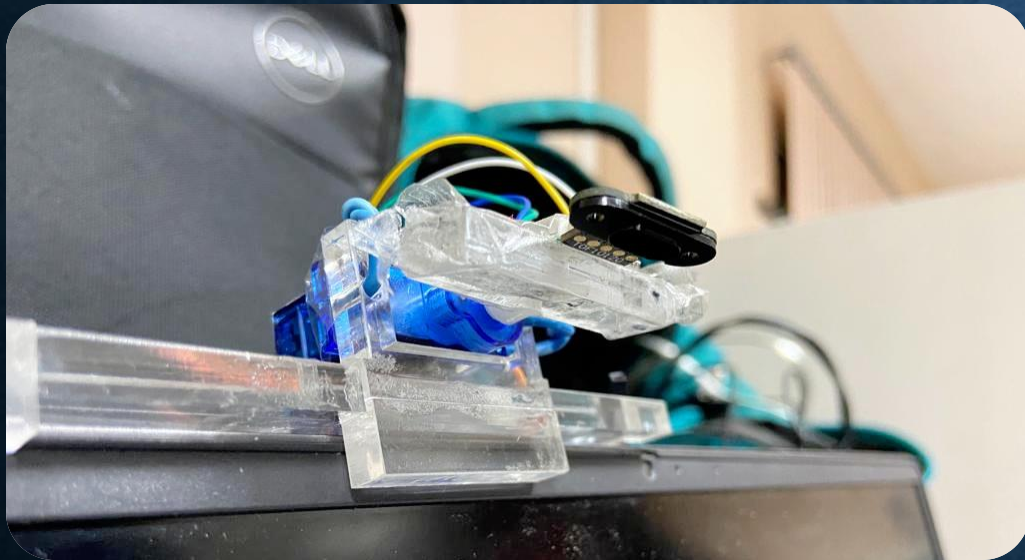
CONCLUSION

❑ The frame is capable of transforming a simple screen into a digital touch screen area which responds to click movements.

❑ We programmed the magic frame so that each area of the screen responds as a portkey press on anything and can talk to it by using a very simple protocol.

❑ It can be extended as a tool to draw various objects and plot its graph without any external aid such as a stylus.

❑ It can be used to play simple games with our touch movements.

FUTURE PROSPECTS

❑ It can completely replace a touch screen laptop
by including swipe, pinch, zoom movements as well.

❑ We can build a flappy bird game which
can be Controlled by our finger movements.

❑ We can have a keyboard template placed on the flat surface and
have our module map of those keys so we can make a
touch keyboard.

LIMITATIONS

❑ The communication between Arduino and Python creates some lag in touch movements.

❑ The sensor takes some time to note the readings which moves the servo slow.

❑ If u wanted to make it fully touchscreen we have to make different sort of gestures

ADVANTAGES

❑ It is a completely cost effective alternative as compared to existing solutions such as Air bar which costs around 10 times more than our product.

❑ Magic frame is a pocket friendly portable device to make our life easier.

REFERENCES

1. For parts of the magic frame-

- Arduino: https://robu.in/product/uno-r3-ch340g-atmega328p-development-board-with-micro-usb/

- Time of flight sensor:

- https://robokits.co.in/development-board/sensors-compatible-with-arduino/laser-ranging-tof10120-sensor-module-uart-i2c-3-5v-range-10-180cm

2. Tutorial series for Arduino- Tutorial Series for Arduino by Paul McWhorter, You Tube Video.

3. For python- Python Tutorial