

THE KAVERY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING



TECHNICAL SEMINAR

AI HEALTH MONITORING SELF SENSING AMBU VENTILATOR

Presented by,
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MECH-FINAL YEAR

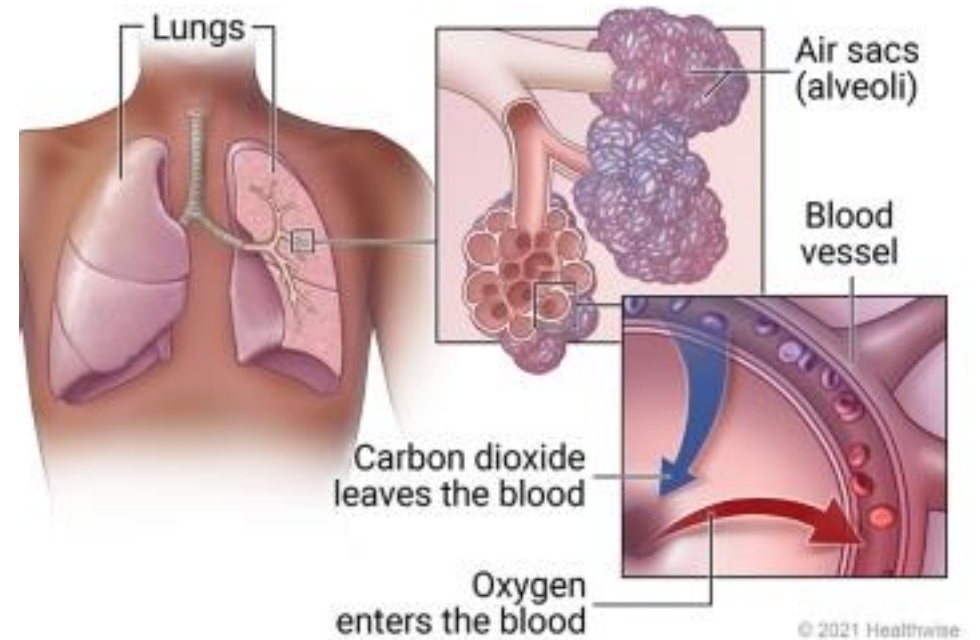
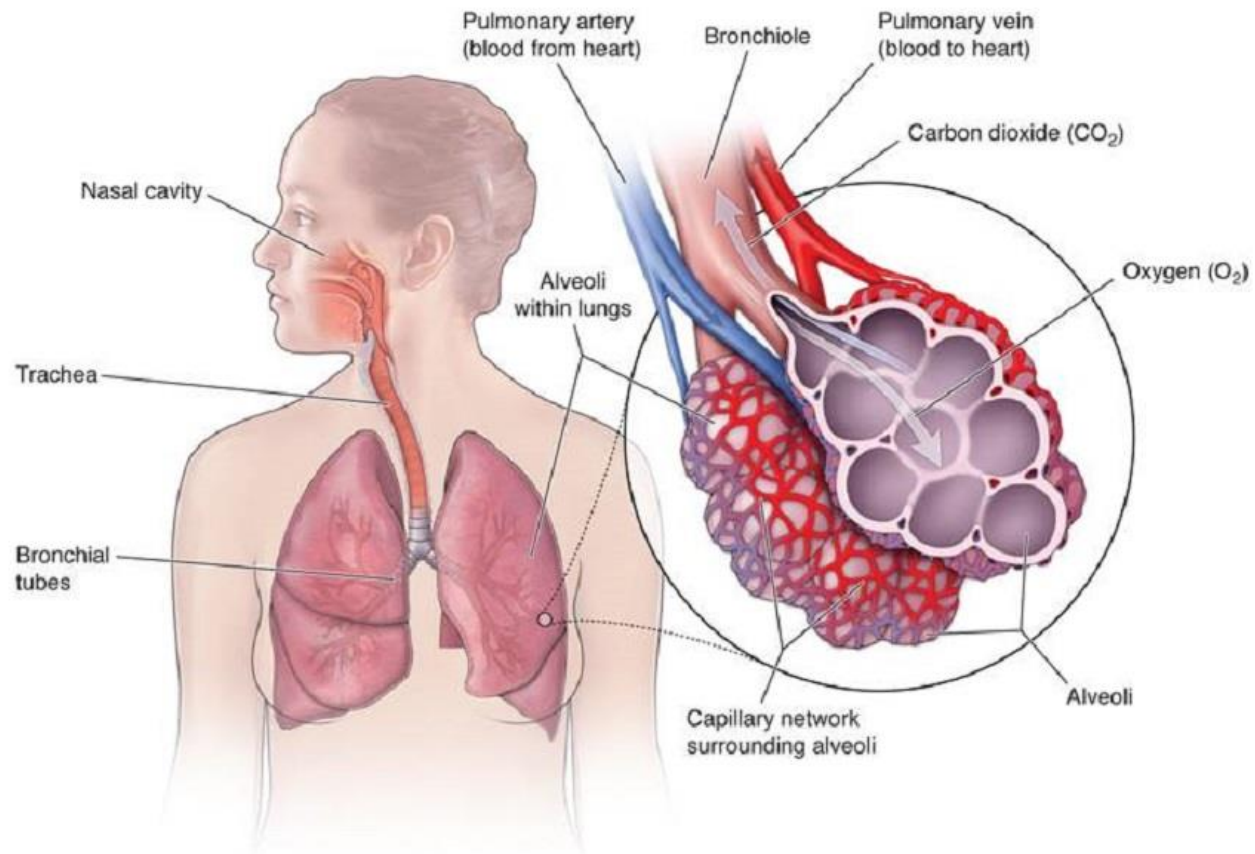
LIST OF CONTENT

- Abstract
- Problem identification
- Existing system
- Proposed system
- Block Diagram
- Hardware
- Software
- Advantages
- Result and discussion
- Conclusion
- Future Enhancement

ABSTRACT

Self sensing automated decision making of ambu bag air flow motion control based on human SPO2 level , monitoring heart rate ,humanbody temperature by using machine learning and deep learning algorithms. This ventilator helps to assist who suffered severe respiratory illness for improve breathing rate in emergency conditions and making call ,sms alert intimation to caring persons in severe low health conditions

LUNG'S ANATOMY



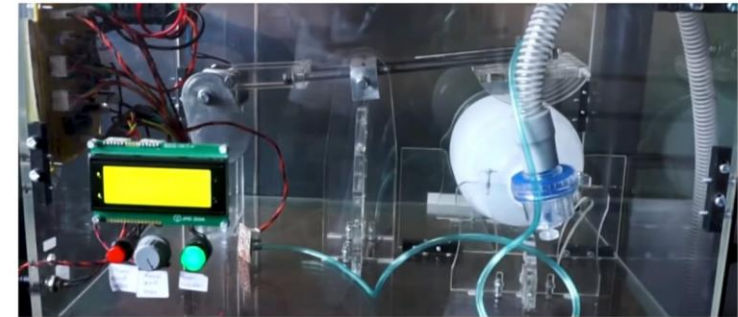
PROBLEM IDENTIFICATION

Without oxygen cylinder ambu bag used for respiratory patients. In Ambulance only manual ambu bag is used in assisting for breathing. If we use manual ambu bag, it will damage our lung tissues due to improper pressure given to lungs. so overcome this problem we are implementing auto sensing lung pressure devices and automated ambu bag with monitor to provide breathing to patients without damaging their lung tissues.



EXISTING SYSTEM

- In 2010, This paper describes a low-cost portable mechanical ventilator.
- In 2019, This paper proposes a Bag-Valve-Mask (BVM) ventilation mechanism.
- In 2021, This paper represents the IOT based ventilator.



PROPOSED SYSTEM

- Develop the self sensing breathing motions, assisting breathing mechanism and monitor health conditions by using AI algorithms
- Automated mechanism to push the ventilator ambu bag with help of MG995 servo motor, MAX30100 heart rate and temperature sensor, GSM and ESP8266 module with wi-fi has been utilized.

ARTIFICIAL INTELLIGENCE

- Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems.
- Specific applications of AI include expert systems, natural language processing, speech recognition and machine vision.
- Artificial intelligence (AI) makes it possible for machines to learn from experience, perform human-like tasks.
- Most AI examples are chess-playing computers, self-driving cars.

MACHINE LEARNING ALGORITHMS

➤NLP

➤NEURAL NETWORK

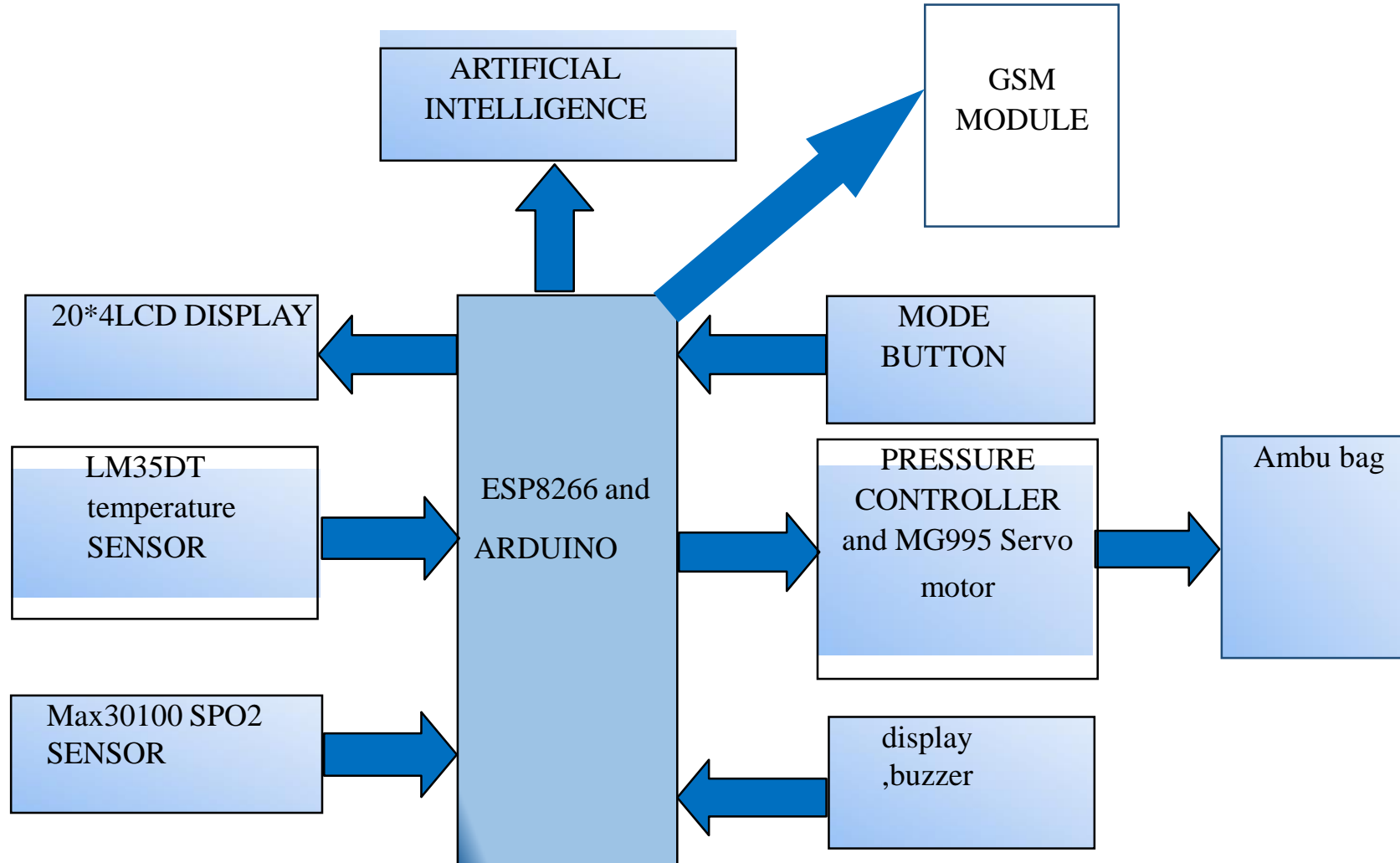
➤GRADIENT BOOSTING

➤Program language used : C++,python

SOFTWARE

- Arduino integrated development environment (IDE) with cp2102,
- For esp8266 with CH340
- Code vision AVR with library sources
- Program language basic C++,PYTHON
- Android application or web application

BLOCK DIAGRAM

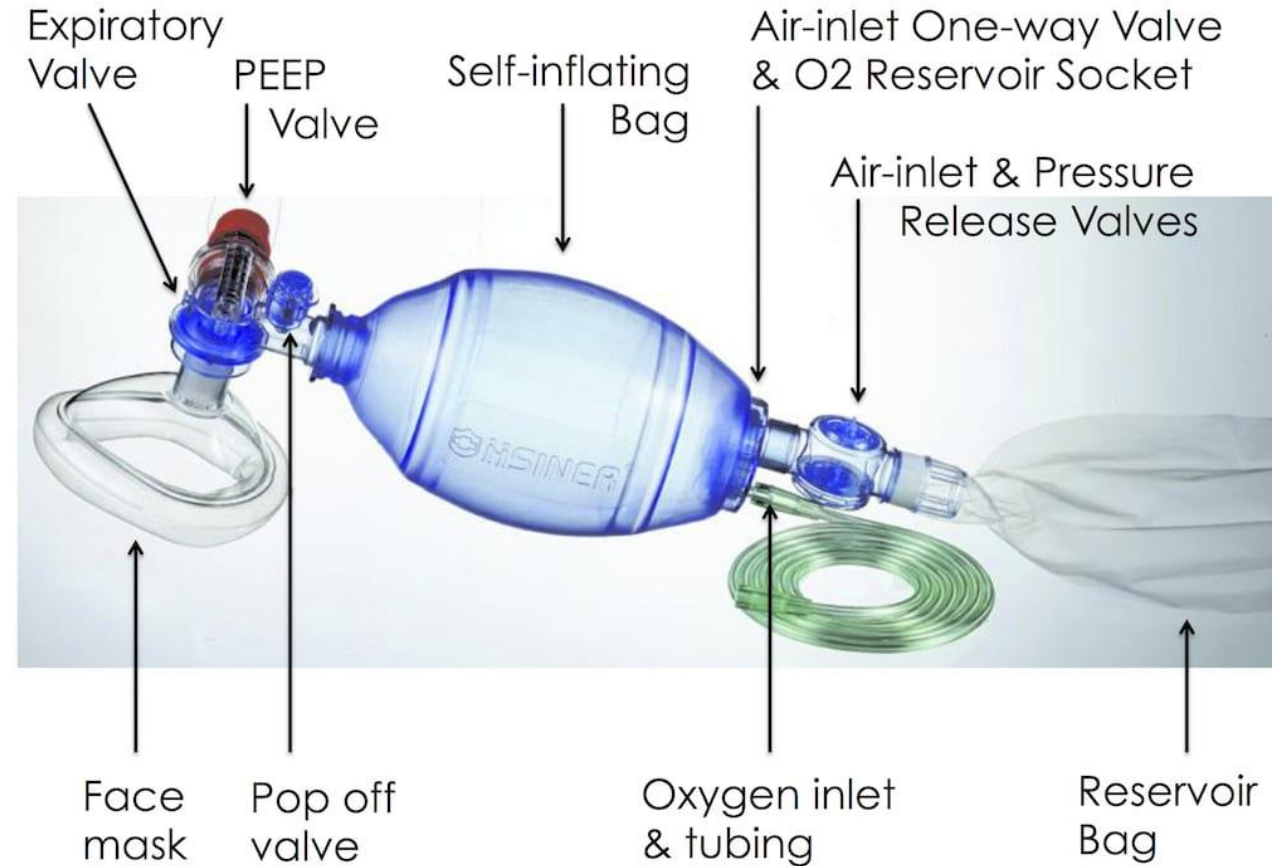


HARDWARE

- Arduino Uno
- ESP8266
- GSM MODULE
- LCD display
- SENSORS= MAX30100,LM35DT
- MG995 SERVO MOTOR

AMBU BAG

- BAG VALVE MASK is known as ambu bag or self inflating bag
- Its used to deliver positive pressure ventilation to any subject with insufficient or ineffective breaths



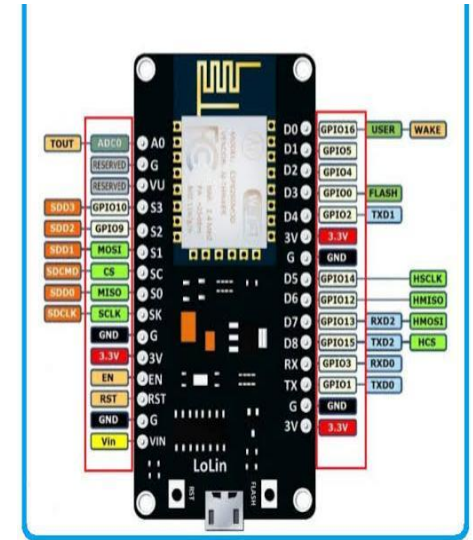
ARDUINO UNO

➤ ESP8266 MICROCONTROLLER

The ESP8266 is a low-cost Wi-Fi microchip, with built-in TCP/IP networking software, and microcontroller capability, produced by Espressive Systems.

➤ ARDUINO UNO

Arduino uno is open source microcontroller board based on Atmega 328.

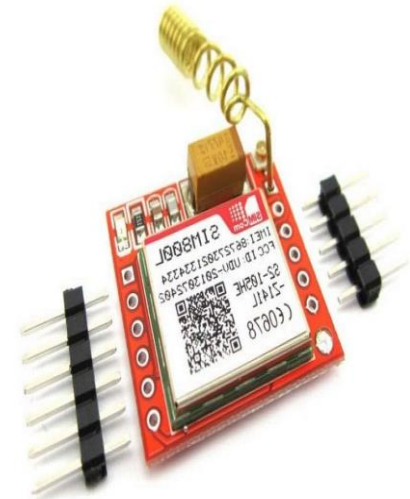


MG995 SERVO MOTOR

- MG995 servo motor is a high speed standard servo can rotate approximately 180 degrees

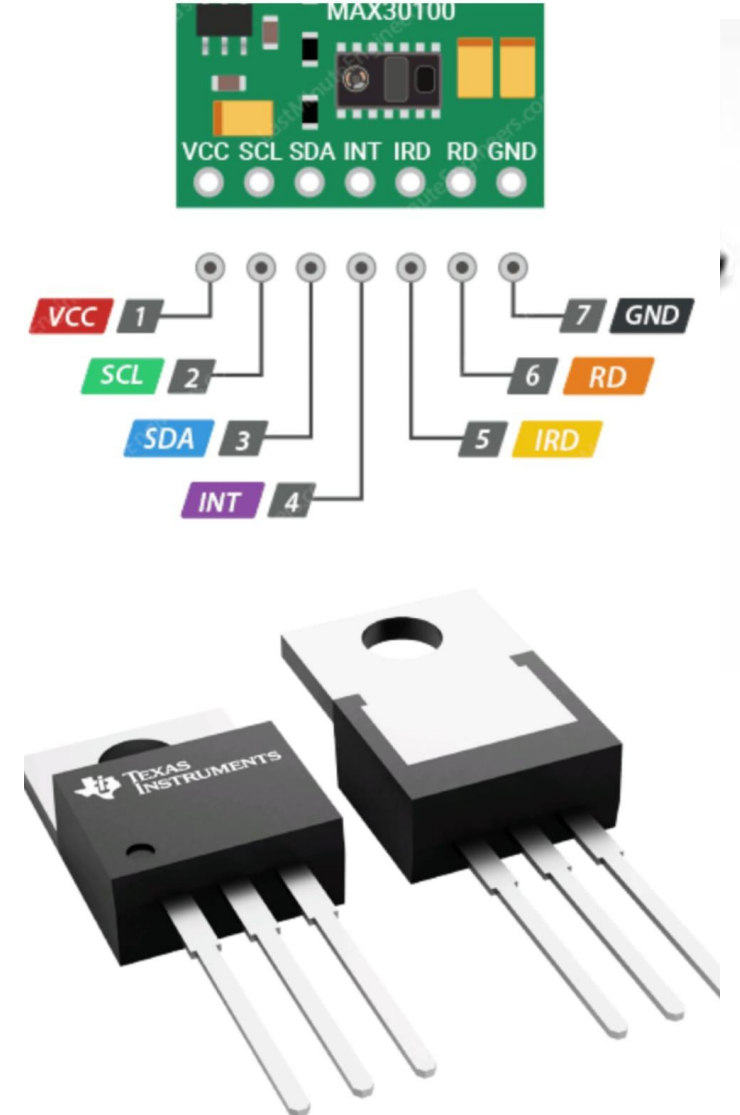
GSM module SIM800L

- The SIM800L module is a reliable and efficient solution for adding cellular connectivity to devices such as IoT devices, alarms, remote controls. The SIM800L GSM module is small in size, low in power consumption and easy to integrate into any system with its UART and ADC interfaces

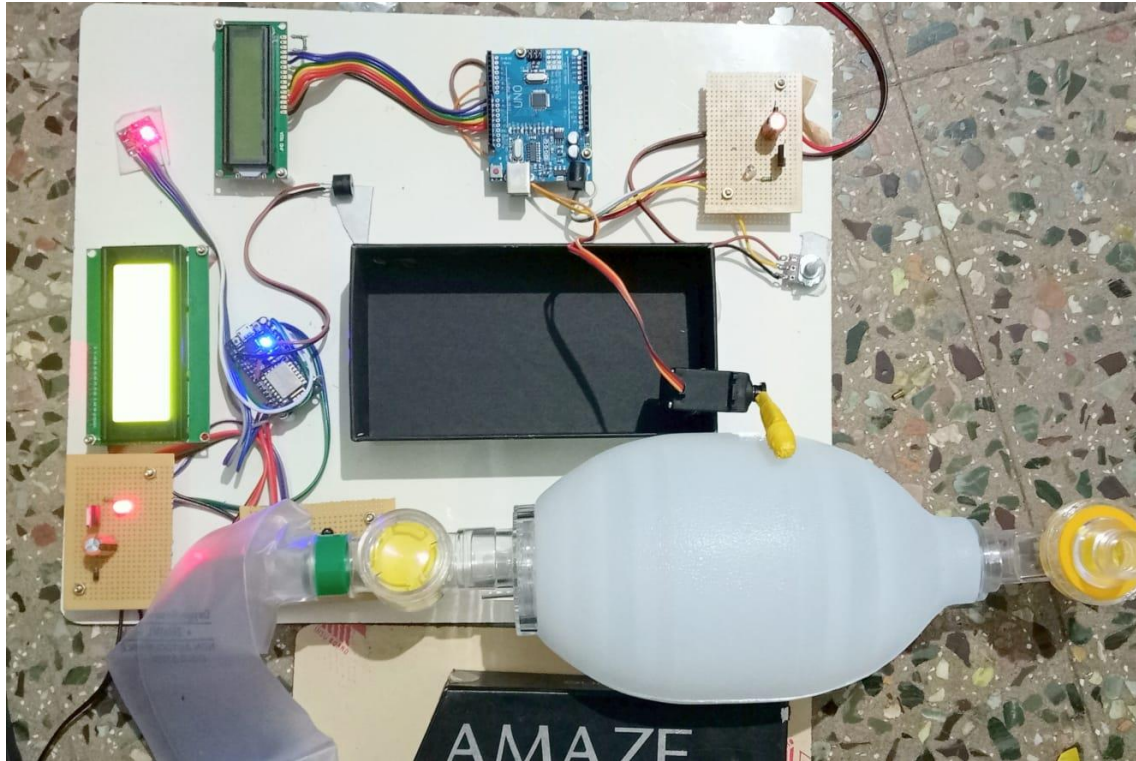


SENSORS

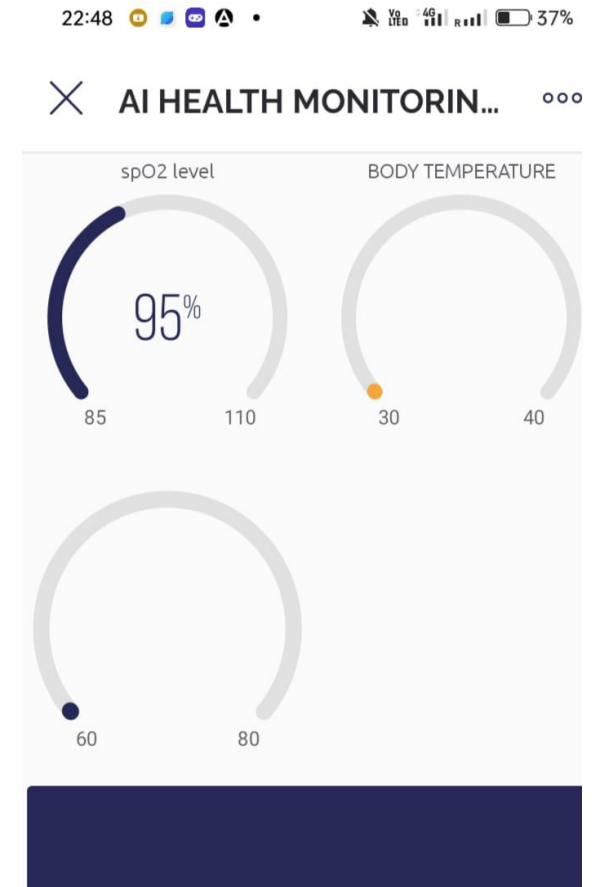
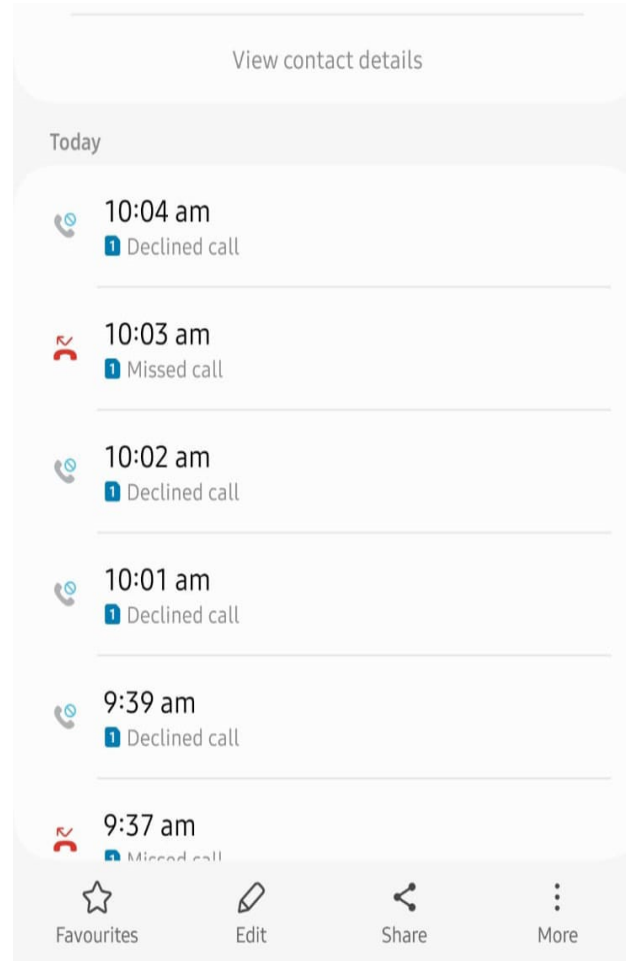
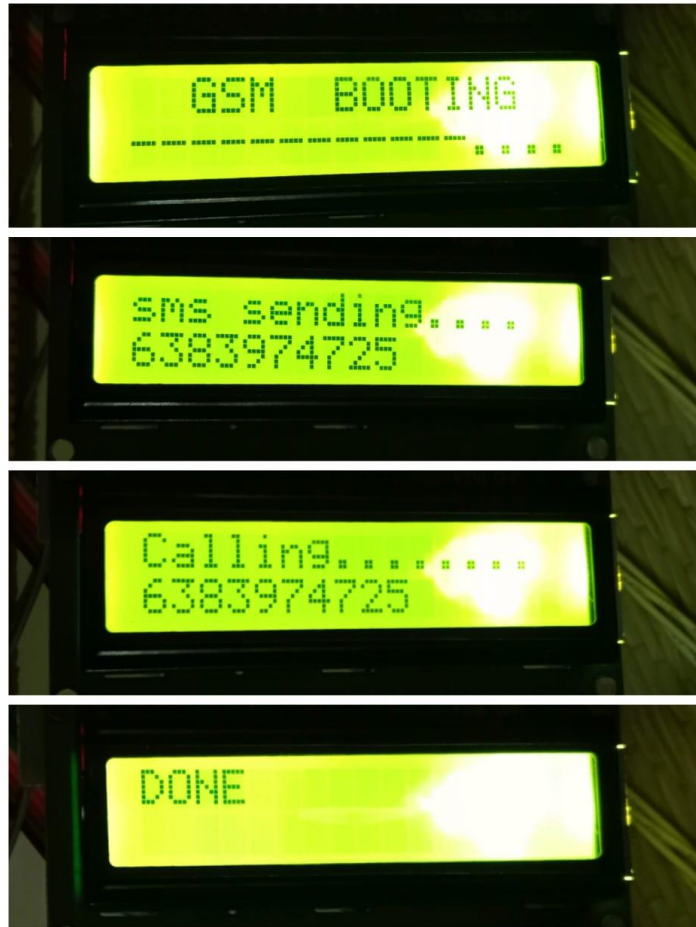
- MAX30100 pulse oximeter and heart rate sensor
- sensor can measure blood oxygen levels or oxygen saturation in your blood.
- Blood oxygen levels are indicated as SpO2, which is the percent saturation of oxygen in the blood. 95%-100%.
- LM35DT is temperature sensor .it can measure our body temperature variations



RESULT AND DISCUSSION



OUTCOME



ADVANTAGES

- Self sensing decision making by collection of human health datas
- Monitor our health condition with making call and sms alarm system
- Using AI software to decision making for spo2 and monitor human heart rate, body temperature
- Automatic and manual operation without oxygen cylinder
- Speed control

CONCLUSION

- Ambu bag pressure, volume controlled in real time are displayed in lcd display and android smart phones. This helps mainly in assisting breathing for child to adult of all age group patients.
- Machine learning models can predict disease risk based on patient data.
- AI enables the customization of treatment plans based on a patient's genetic makeup and medical history.

