SAINTGITS
COLLEGE OF ENGINEERING
(AUTONOMOUS)

# Project Phase II

## Final Review

Project Assessment Board (PAB) Members

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# Project Area: Robotics

# Project Topic : Design and Fabrication of Robot for Assistance in Rescue Operations during Flood


**Supervisor**

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Designation: Asst. Professor

**Presented by**

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S8 RB

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# Contents

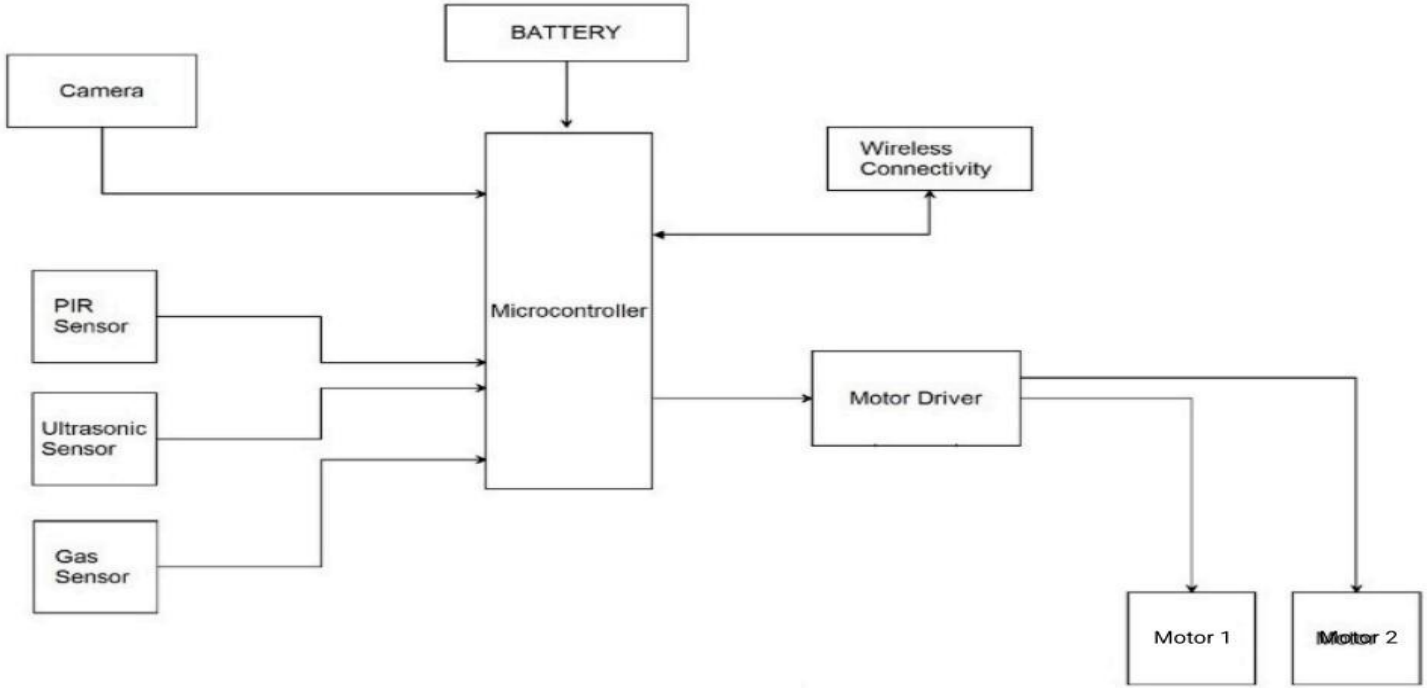
# INTRODUCTION

- Floods are natural disasters that can result in extreme level of consequences.
- During such emergencies, rescue operations plays a crucial role in saving lives.
- Delay in rescue operations causing threat to the lives.
- For avoiding this situation to an extent, the robot helps to find the person by real time data.
- Using PIR Sensor we can detect humans trapped or confined in flooded area.
- To detect amorphous gases

# OBJECTIVE

- The main goal is to develop a bluetooth based robot that assists in rescue operations during flood.
- To provide live feed visuals of the path it travels.
- To assist in search and rescue activities.
- To detect amorphous gases.
- To carry necessary medicines in a small box and to deliver it to people stuck in flooded areas.

# BLOCK DIAGRAM



- When the rescue robot detects any movement came in front of the path, the PIR sensor  detects the movement and sends signal to the control unit.
- The control unit sends signal to the Bluetooth module and  to the mobile application.
- Amorphous gas detection is possible by gas sensor(MQ135) in the robot and can be analysed.
- Distance can be measured using ultrasonic sensor in the robot and can we viewed.
- Live video recording is possible using an IP webview application using a smartphone.
- An emergency medicine and food box is placed in the robot which can be opened using the application.

# COMPONENTS USED

- Arduino Uno
- Motor driver
- DC motor
- Bluetooth module
- Ultrasonic sensor
- PIR sensor
- Gas sensor
- Limit Switch
- Servo motor
- Aluminium sheets
- PVC pipe and end caps
- 12V battery
- Battery wire connector

# Arduino Uno

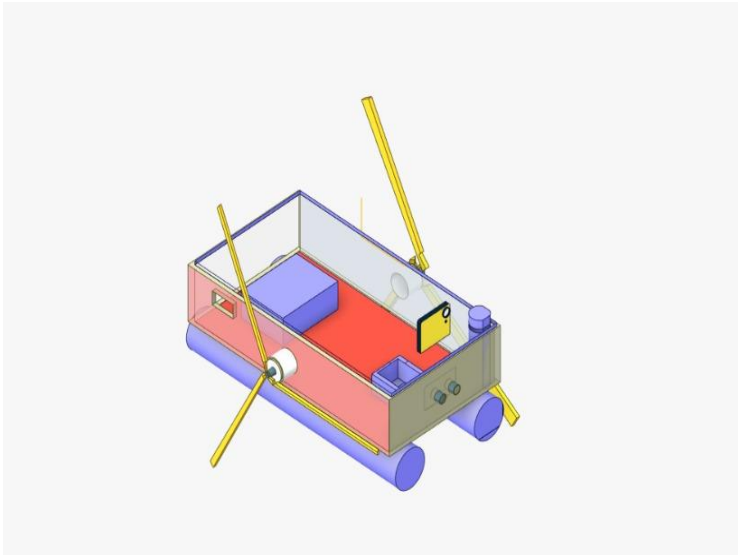
- Arduino Uno is an open-source microcontroller board
- Based on the ATmega328P microcontroller.
- Widely used in various projects ranging from robotics to home automation.
- The board has :
  - 14 digital input/output pins
  - 6 analog input pins
  - a 16 MHz quartz crystal oscillator
  - a USB connection
  - a power jack
  - an ICSP header
  - a reset button.

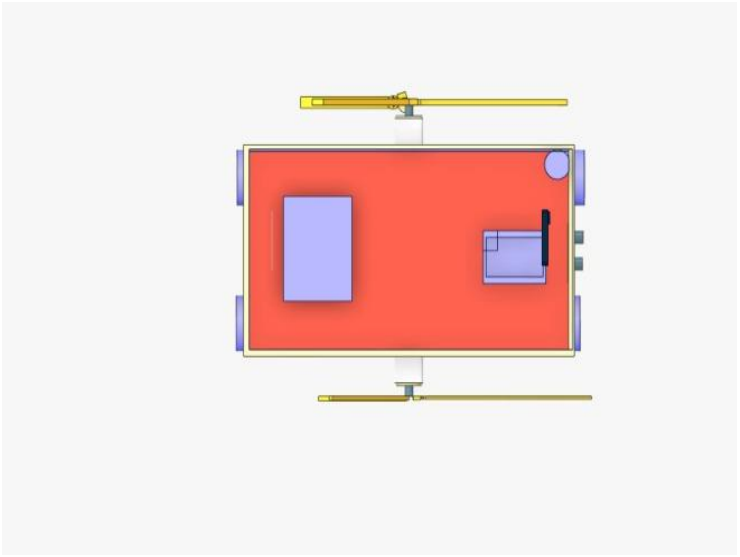
# TOOLS REQUIRED

- Software
  - Arduino IDE
  - IP webview
  - Mobile Application

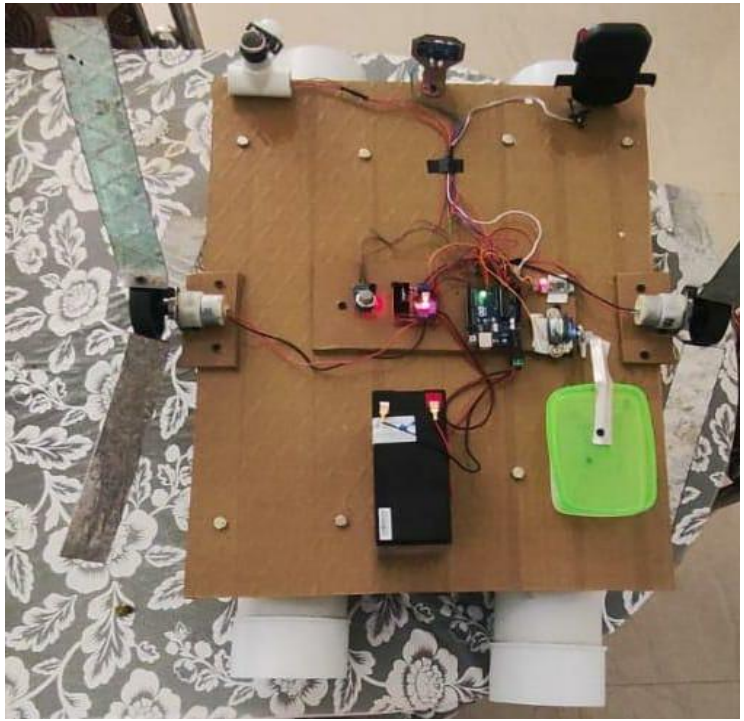
- Hardware
  - PVC pipes
  - BLDC motors
  - Propellers
  - Aluminium Sheet
  - Battery
  - Sensors

# DESIGN LAYOUT

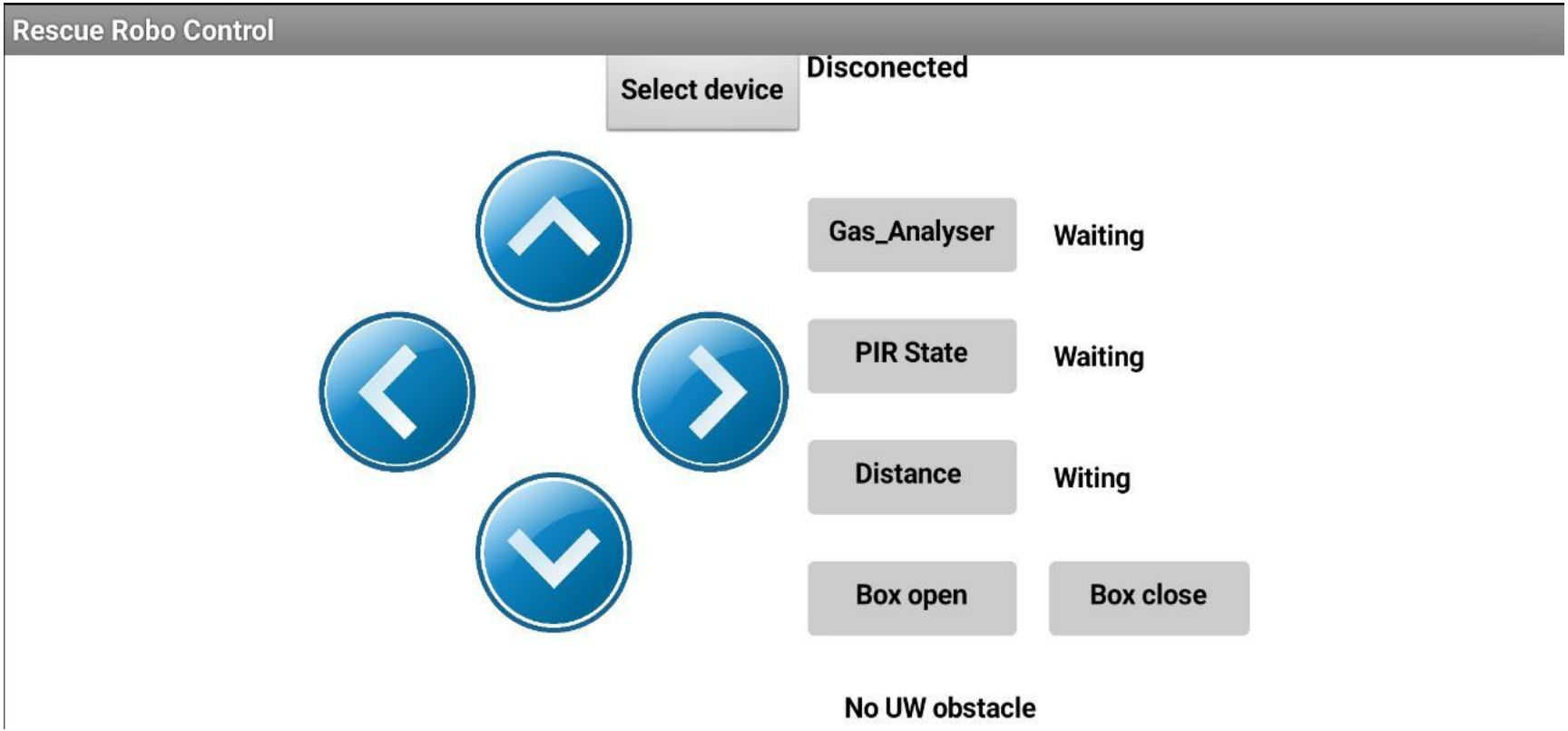




# RESULTS



# App Interface



# PROJECT TIMELINE

| | Week 1 | Week 3 | Week 5 | Week 7 | Week 9 | Week 10 | Week 11 | Week 12 |
|---|---|---|---|---|---|---|---|---|
| Study of Components | | | | | | | | |
| Structure Design | | | | | | | | |
| Assembly of Components | | | | | | | | |
| Implementation | | | | | | | | |
| Prototype Testing | | | | | | | | |
| Report Writing | | | | | | | | |
| Publication | | | | | | | | |

# TASK ALLOCATION

- Aleena - Literature Survey, Study of components, Testing , Report writing, Publication
- Alkesh - Literature survey, study of components, Design, Testing, Assembly
- Brahamajith - Literature Survey, Study of components, Testing,Assembly
- Nayan - Literature survey, study of components, Design, Testing, Assembly

# FUTURE SCOPE

- Intelligent Navigation and Mapping
- Remote monitoring and Control
- Autonomous Rescue Actions
- Integration with IoT and Cloud Services
- Swarm Robotics

# CONCLUSION

- The main aim of this project was to construct a rescue robot which provides the service of rescue operations during flood season.
- We have designed and developed a model robot which can sense people, distance, obstacle and various other functions.
- This is a low cost service robot which can be designed and used for rescue operations.
- A promising solution to enhance rescue operations during flood situations.
- The flood rescue robot offers an efficient and reliable solution for locating individuals in flood affected areas.

# REFERENCES


1. Vishwakarma, V. K. and Chavan, S. B. (2021), "Review on flood disaster rescue robots: Issues, challenges, and solutions". In Advances in Robotics and Intelligent Systems (pp. 107-123). Springer
2. Shahria, T., Zaman, K.T., Rabbi, S. and Khan, M.M. (2019), "Underwater research and rescue robot", IEEE International Conference on Electrical, Computer and Communication Technologies (ICECCT) (pp. 1-5). IEEE.
3. Afridi, A., Minallah, N., Sami, I., Allah, M., Ali, Z. and Ullah, S. (2019), "Flood rescue operations using artificially intelligent UAVs", 15th International Conference on Emerging Technologies (ICET) (pp. 1-5). IEEE.
4. L. Liang, X. Wang, and H. Chen(2018), "Design of a wireless communication system for flood rescue robot" , 13th World Congress on Intelligent Control and Automation (WCICA), pp. 194-199.
5. R. V. Shinde, S. M. Utkarsh, V. B. Patil, and V. N. Yadav (2017), "Flood rescue robot for effective disaster management" , International Conference on Energy, Communication, Data Analytics and Soft Computing (ICECDS), pp. 452-457.

# Thank You