

Sea Surveillance and Narcotics Ship

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Abstract: Numerous of the crimes take place from the seven seas route. Pharmaceutical dealing or terrorist attacks can be avoided or kept under surveillance. Multiple other vessels which are unknown or vessels which have been lost can be searched with the help of this Multipurpose RC boat. Water is vital for diurnal life, but unfortunately, the same water that sustains life can also be dangerous occasionally, frequently people come victims of disasters, get stranded in dangerous waters, delivering similar people is extremely delicate and frequently going the loss of precious time which can occasionally lead to loss of life. Our system aims to break this problem, this system principally is a Multi-purpose ocean Surveillance with Search & Rescue RC Boat, which helps to find similar stranded people, the design is remote- operated and controlled by an RC remote using which it can be maneuverer consequently, we use DC pumps to give the forward propulsion and servo motor arrangement to give with the steering. Our design also comprises of an ultrasonic detector that can descry a handicap in front of the boat and can stop the boat from colliding with the handicap therefore avoiding any accidents or mishaps. Fresh lights are enforced to give visibility during night time making the deliverance operation more effective.

Keywords: Sea surveillance, Multipurpose RC boat, Search and deliver, naval purpose

I. INTRODUCTION

There is a need for Coastal guarding not only for sudden attacks but also for tracking & taking down mood-altering substances. It is not always possible to keep an eye on the sea by sending heavy boats and officials, rather we can use 'The sea surveillance robo. Not only human's efforts will be reduced but there are additional features like humidity and temperature will be sensed and can be stored. The robo will broadcast live footage of the area and also be controlled by an operator as per the requirement. A sea surveillance boat equipped with a WiFi module, humidity and temperature sensors, and live broadcast capabilities over WiFi is a high-tech vessel designed to provide real-time surveillance and monitoring of marine environments. The WiFi module allows the boat to connect to the internet and provide live streaming of the video feed to a remote location, making it possible to monitor the environment in real-time. The humidity and temperature sensors provide accurate measurements of these two critical environmental factors, which are important indicators of weather patterns and potential changes in the marine environment. By monitoring these parameters, the boat's crew can identify potential risks to the environment and take appropriate measures to prevent or mitigate them.

II. RELATED WORK

- Sairdrones - Sairdrones is an autonomous sailing drone that is equipped with various sensors, including cameras, which can capture real-time video footage of the marine environment. The video footage is then transmitted over a satellite or cellular network for real-time analysis and monitoring.
- Blueye Robotics - Blueye Robotics produces underwater drones that are equipped with a Wi-Fi module and live video broadcasting capabilities. These drones are designed for underwater exploration, research, and inspection, and can transmit high-quality video footage to a remote location in real-time.
- Deep Trekker - Deep Trekker produces underwater drones that can be used for sea surveillance and monitoring. These drones are equipped with a Wi-Fi module and live video broadcasting capabilities, allowing for real-time monitoring of the underwater environment.

- OpenROV - OpenROV produces remotely operated underwater vehicles that are equipped with a Wi-Fi module and live video broadcasting capabilities. These vehicles can be used for underwater exploration, research, and inspection, and can transmit high-quality video footage to a remote location in real-time

III. METHODOLOGY

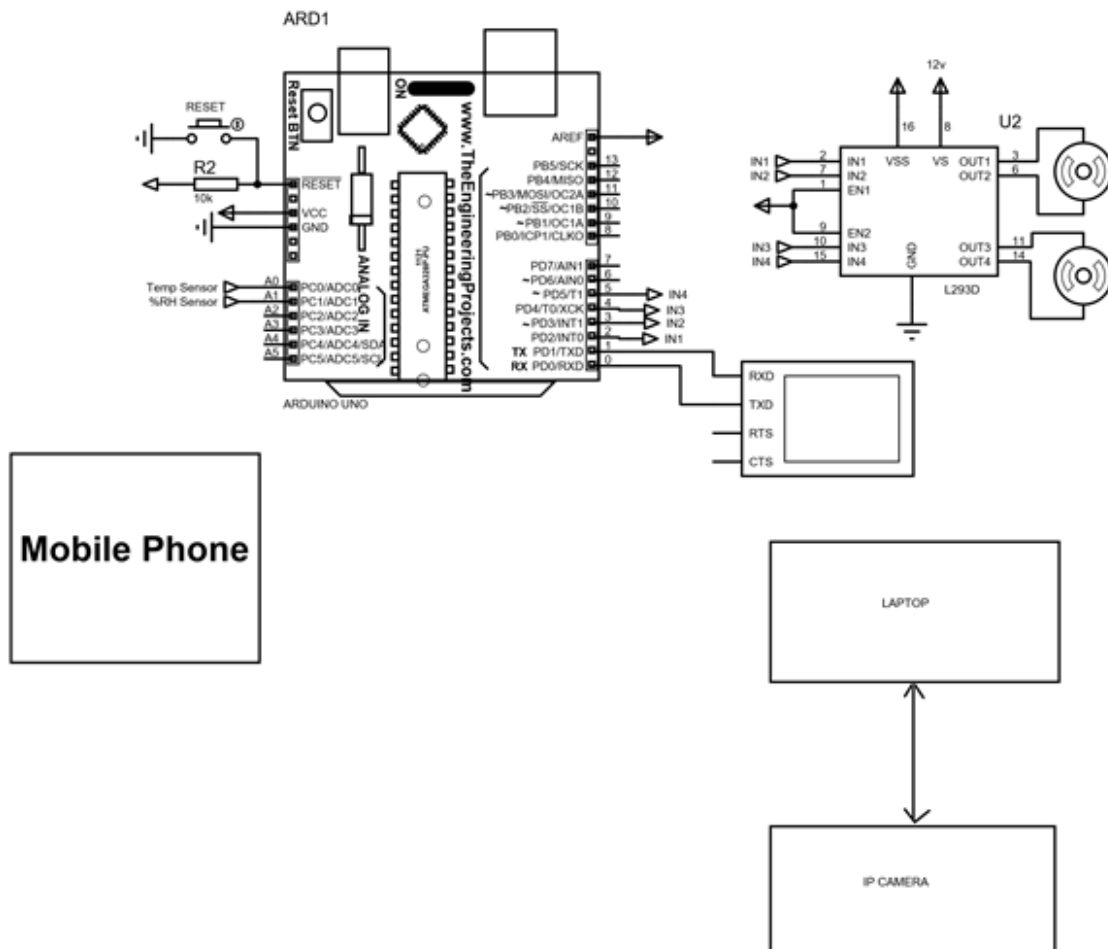
The methodology of a sea surveillance boat based on a Wi-Fi module and live footage broadcasting over a Wi-Fi connection using an AVR microcontroller involves designing the hardware, programming the AVR microcontroller, establishing the Wi-Fi connection, and capturing and transmitting live footage. To begin with, the hardware of the boat, including the Wi-Fi module, camera, and AVR microcontroller, needs to be designed. The Wi-Fi module should provide a stable internet connection, and the camera should capture high-quality live footage.

The AVR microcontroller needs to be programmed to control the camera and Wi-Fi module. C language and AVR Studio software can be used for programming the microcontroller.

After the hardware and programming are completed, the Wi-Fi connection needs to be established by connecting the boat's Wi-Fi module to a network with an internet connection. This can be done using a nearby Wi-Fi network or a smartphone hotspot.

Finally, the camera needs to capture live footage of the surrounding area, which is then transmitted over the Wi-Fi network. The AVR microcontroller should control the camera and send the footage over the network, allowing for remote surveillance of the boat's surroundings. This methodology can be useful for various applications such as monitoring marine life, tracking boats, and identifying hazards in the water.

IV. SYSTEM CIRCUIT DIAGRAM



V. HARDWARE COMPONENTS

- Dc motor
- Motor driver
- Wifi Module
- Temp/ humidity Module
- Esp 32 Cam
- Battery
- Microcontroller
- DC Motor

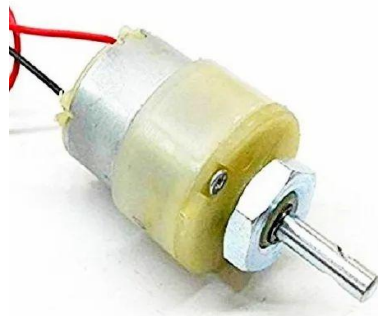


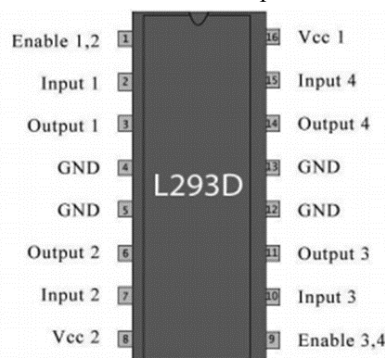
Fig.1 (12V DC Gear Motor, 150RPM)

Speed	150RPM
Voltage	12V
Features	6mm shaft diameter with internal hole
Load Current	300 mA(Max)
Weight	125gm

Motor Driver

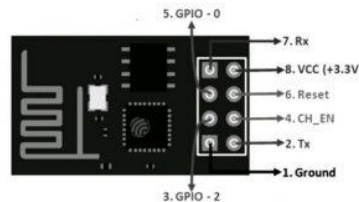
- Wide Supply-Voltage Range: 4.5 V to 36 V
- Separate Input-Logic Supply
- Internal ESD Protection
- Output Current 1 A Per Channe
- Peak Output Current 2 A Per Channel

The L293 is designed to provide bidirectional drive currents of up to 1 A at voltages from 4.5V to 36 V.



Wifi Module

The ESP8266 Wi-Fi module comes with a boot ROM of 64 KB, user data RAM of 80 KB, and instruction RAM of 32 KB. It can support 802.11 b/g/n Wi-Fi network at 2.4 GHz along with the features of I2C, SPI, I2C interfacing with DMA, and 10-bit ADC. Interfacing this module with the microcontroller can be done easily through a serial port. An external voltage converter is required only if the operating voltage exceeds 3.6 Volts. It is most widely used in robotics and IoT applications due to its low cost and compact size.



The applications of the ESP8266 Wi-Fi module are given below

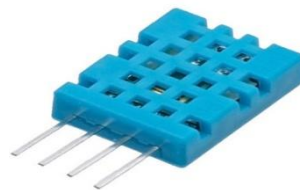
- Access points portals
- IoT projects
- Wireless data logging
- Used in learning the networking fundamentals
- Sockets and smart bulbs
- Smart home automation systems

Temp/ Humidity Module

DHT11 sensor consists of a capacitive humidity sensing element and a thermistor for sensing temperature. The humidity sensing capacitor has two electrodes with a moisture holding substrate as a dielectric between them. Change in the capacitance value occurs with the change in humidity levels. The IC measure, process this changed resistance values and change them into digital form.

For measuring temperature this sensor uses a Negative Temperature coefficient thermistor, which causes a decrease in its resistance value with increase in temperature. To get larger resistance value even for the smallest change in temperature, this sensor is usually made up of semiconductor ceramics or polymers.

The temperature range of DHT11 is from 0 to 50 degree Celsius with a 2-degree accuracy. Humidity range of this sensor is from 20 to 80% with 5% accuracy. The sampling rate of this sensor is 1Hz .i.e. it gives one reading for every second. DHT11 is small in size with operating voltage from 3 to 5 volts. The maximum current used while measuring is 2.5mA.



ESP 32 cam



ESP32-CAM is a low-cost ESP32-based development board with onboard camera, small in size. It is an ideal solution for IoT application, prototypes constructions and DIY projects. The board integrates WiFi, traditional Bluetooth and

low power BLE , with 2 high performance 32-bit LX6 CPUs. It adopts 7-stage pipeline architecture, on-chip sensor, Hall sensor, temperature sensor and so on, and its main frequency adjustment ranges from 80MHz to 240MHz. Fully compliant with WiFi 802.11b/g/n/e/i and Bluetooth 4.2 standards, it can be used as a master mode to build an independent network controller, or as a slave to other host MCUs to add networking capabilities to existing devices

- Up to 160MHz clock speed, Summary computing power up to 600 DMIPS
- Built-in 520 KB SRAM, external 4MPSRAM
- Supports UART/SPI/I2C/PWM/ADC/DAC
- Support OV2640 and OV7670 cameras, Built-in Flash lamp.
- Support image WiFi upload
- Support TF card
- Supports multiple sleep modes.

Battery



12V 1.2Ah Rechargeable Lead Acid Battery is normally used for robots in the competition. Wired or Wireless Robots run for a long time at high speed with this type of battery. Seal Lead Acid (SLA) rechargeable battery is the most common general purpose battery. Low cost, robust and less maintenance required are the advantages of SLA. But it is considered heavy weight for certain robotic applications. To charge SLA batteries, you can use any general DC power supply as long as it provides the correct voltage to your battery.

Features:

- Rechargeable
- Recyclable
- No Memory Effect
- Able to use for most of the 12V controllers, motors, or any other appliances

Specs:

- Battery Type: Sealed Lead Acid Battery
- Chargeable Type: Yes
- Voltage rating: 12 V
- Current Rating: 1.2 Ah
- Length: 95 mm
- Width: 42 mm
- Height: 50 mm
- Approx Weight: 553 gm

Microcontroller



IC type: AVR microcontroller
Core size: 8-bit
Speed: up to 20MHz
Number of I/O: 23
Program memory size: 32Kb (16K x 16)
Program memory type: Flash
EEPROM size: 1K x 8
RAM size: 2K x 8
Package: DIP-28 (0.1" x 0.3" pin spacing)
Supply voltage: 1.8 V - 5.5 V
Lead-free (RoHS compliant): Yes
Manufacturer: Atmel
Manufacturer part number: ATmega328P-PU

- High Performance, Low Power Atmel®AVR® 8-Bit Microcontroller
- Advanced RISC Architecture
- Special Microcontroller Features
- I/O and Packages – 23 Programmable I/O Lines
- Operating Voltage: – 1.8 - 5.5V

VI. CONCLUSION

In conclusion, a sea surveillance boat based on a Wi-Fi module and live footage broadcasting over a Wi-Fi connection using an AVR microcontroller can be a useful tool for keeping an eye on sea posts and preventing hazardous situations. The boat can be used for monitoring marine life, tracking boats, and identifying hazards in the water, such as rocks, sandbars, or other obstructions. The live footage transmission over the Wi-Fi network allows for remote surveillance of the boat's surroundings, enabling quick responses to any potential threats or hazards. This type of sea surveillance boat can save lives and resources, making it an essential tool for marine safety and security. Its capability to transmit real-time video and other data can help in better decision-making, especially in critical situations, making it an excellent choice for sea surveillance operations.

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