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Improve the Security of Fishermen by Implementing a Border Alerting System

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ABSTRACT:

The Fisherman Border Alerting System is designed to make coastal fishermen's lives easier by providing them with real-time updates about border security, pirate risks, and dangerous situations. These messages are sent via communication systems, buzzer alarms, the Internet of Things (IoT), and GPS. The system's integration of these technologies prevents fishermen from inadvertently crossing borders by ensuring they stay inside safe fishing zones. The Internet of Things (IoT) allows for smooth data transfer, global positioning systems (GPS) provide precise location tracking, buttons offer control, and buzzers indicate danger instantly. Reduced dangers and increased efficiency at sea are only two ways this method enhances marine safety for fisherman.

Introduction

A fisherman's skill in navigating large bodies of water is crucial to the success and security of those who rely on fishing as a profession or pastime. This technology is comprised of many equipment designed for use in marine environments, including global positioning systems (GPS) units, nautical charts, and specialist software. All of these parts contribute to the overall success of fishing in several ways. Being able to determine their precise position allows them to discover the most ideal fishing spots. Avoiding collisions with other boats is one of the primary goals of this kind of navigation system. By making fishing safer and protecting marine resources, this technology is essential to the growth of a sustainable fishing sector. The best anglers are always ready for sea changes because real-time weather, tide, and other relevant information updates are conveniently accessible. However, because to the immense size and absence of land routes, maritime navigation is a complicated discipline that differs greatly from road transportation. The Global Positioning System's extensive steering capabilities and accurate timing services make it a valuable tool. Maritime, oceanic, yacht, and ship tracking, as well as border protection, are just a few of the many uses for technologies developed for the Global System for Mobile Communications. The significance of navigation systems is emphasized in coastal countries since fishing is the main source of livelihood for these nations. This is because these nations are located on peninsulas, islands, or have marine boundaries. If the marine industry is serious about improving its sustainability, efficiency, and safety, it must use modern navigational systems such as GPS and GSM. This includes the fishing business. In the long run, this will benefit fishermen and the whole coastal community.

LITERATURE SURVEY

Using Image Moment Feature Anomaly for Automated Product Boundary Defect Detection [1]. The authors of this work are Yeping Peng (ieee), Songbo Ruan (Guangzhong Cao), Sudan Huang (Ngaiming Kwok), and Shengxi Zhou (IEEE). Critical components of the power distribution pipeline are electric distribution cabinets, which are the subject of this research. An important part of manufacturing is the identification of surface defects. Not only does it ensure high-quality products, but it also influences how people perceive the brand. Metal cabinet edges, in particular, are more likely to sustain damage than those of other materials. [2]. An Algorithm for Tracking Multi-Feature Fusion Using Self-Associative Memory Mechanis Tao Shi, Hongge Ren, Jingjing Qiao, and others The research proposes a multifeatured fusion tracking technique that updates the kernelized correlation filtering approach with a self-associative memory learning mechanism to fix the issues of unstable single features, target reemergence, and short-term

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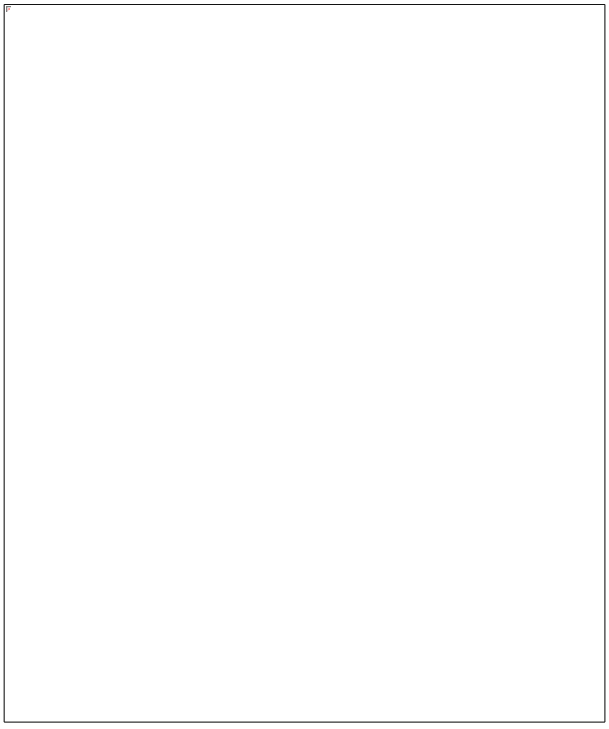
disappearance. To improve feature robustness and gather more target features, fuse color features, directional gradient histogram features, and scale invariant features instead of single features while extracting features.

Methodology

In order to provide a safer and more effective safety system, the suggested Fisherman Border Alerting System incorporates current technologies. An Internet of Things (IoT) network enables smooth data interchange; a GPS module tracks the user's position in real-time; a buzzer sounds an alarm when the user is about to enter a prohibited area; and user-operated buttons allow for emergency contact. When these parts work together, the system can keep fisherman inside safe zones, provide them up-to-the-minute navigational updates, and instantaneously notify authorities if there's trouble. This astute method lessens the occurrence of illegal border crossings while simultaneously improving the security, safety, and operational efficiency of fisherman.



Block diagram.

Arduino uno

A microcontroller board based on the Atmega328, the Arduino Uno is described in the datasheet. A 16 MHz crystal oscillator, 6 analogue inputs, 14 digital input/output pins (including 6 PWM outputs), 1 USB port, 1 power connector, 1 ICSP header, and 1 reset button are all part of it. All you need is a USB cable, an AC-to-DC converter, or a battery to get it going; it comes with everything you need to support the microcontroller.

Because it forgoes the FTDI USB-to-serial driver chip, the Uno stands apart from all previous boards. In its place, you'll find the Atmega8U2 configured to convert USB to serial. "Uno" signifies "One" in Italian and is chosen to commemorate the impending release of Arduino 1.0. Going forward, the Uno and version 1.0 will serve as the reference versions of Arduino. See the index of Arduino boards for a comparison with earlier generations; the Uno is the newest in a series of USB Arduino boards and the platform's standard model.

The USB port or an external power source are both viable options for powering the Arduino Uno. It chooses the power source mechanically. You may use a battery or an AC-to-DC converter (wall-wart) to power it from the outside (not via USB). It is possible to attach the adapter by inserting a 2.1mm center-positive connector into the power port on the board. The POWER connector's Gnd and Vin pin headers are suitable for inserting battery leads. The board is compatible with power sources ranging from 6 to 20 volts. But if the voltage is lower than 7V, the 5V pin could not give 5V and the board might become unstable. The voltage regulator might become too hot and ruin the board if you use more than 12V. A voltage range of 7 to 12 volts is suggested.

LIQUID CRYSTAL DISPLAY

In front of a light source or reflector, a thin, flat display device called a liquid crystal display (LCD) arrays a large number of color or monochrome pixels. Pile of liquid crystal molecules held aloft by two transparent electrodes and two polarizing filters, whose polarity axes orthogonal to one another, make up each pixel. If there weren't liquid crystals interposed, one would block the other from light. Light that enters one filter is able to pass through the other because the liquid crystal bends its polarity.

A program's ability to communicate with the outside world depends on its input and output devices, which in turn rely on human communication. An LCD display is a typical accessory for controllers. The

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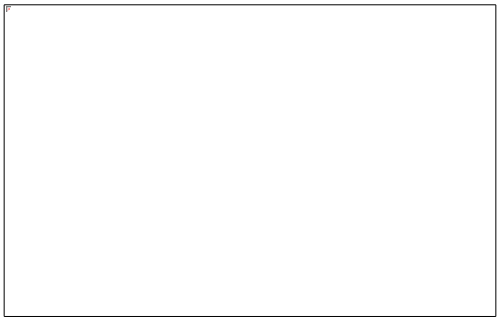
16x1, 16x2, and 20x2 LCDs are among the most popular types of displays that are attached to the controllers. This equates to sixteen characters on a single line. The first set has 16 characters on each line while the second set has 20 characters on each line.



BUZZER

In a magnetic transducer, the circuitry includes an iron core, a yoke plate, a wound coil, a permanent magnet, and a vibrating diaphragm that can be moved. The magnet's field gently draws the diaphragm up nearer the core's surface. A positive alternating current (AC) signal causes the diaphragm to move up and down, which in turn vibrates the air. This is achieved by the current passing through the excitation coil, which forms a fluctuating magnetic field. A resonator, which is composed of a cavity and one or more sound holes, may amplify vibrations in order to generate a loud sound.

ESP8266 Wi-Fi Module

This project revolves on this. The module plays a crucial role in the project as it is centered on WIFI control of appliances. A low-cost Wi-Fi chip with full TCP/IP capability, the ESP8266 Arduino compatible module has an amazing built-in MCU (Micro Controller Unit) that allows you to control I/O digital pins using a simple programming language that is almost pseudo-code like. The Chinese company Es press if Systems is situated in Shanghai and makes this gadget. In August 2014, this chip made its debut in the ESP-01 version module manufactured by the third-party company AIThinker. The MCU can establish basic TCP/IP connections and connect to WiFi networks with the help of this little module. In his Many hackers and tech enthusiasts were interested in exploring and using it for a wide range of projects because to its tiny size and very inexpensive pricing (1.7$ to 3.5$). Since it has been so successful, Espressif has released other variants with varying proportions and technological specs. Among the following is the ESP32. Numerous projects and applications, such as home automation, may be found online.

RELAYS

Many household and commercial equipment, as well as industrial control systems, make use of electrically controlled switches called relays. By using a relay, two independent voltage sources may be isolated from one another; in other words, a little quantity of voltage or current on one side can manage a big amount of current or voltage on the other side, and vice versa.

GPS

An example of a GNSS produced by the US Department of Defense is the Global Positioning System (GPS). As far as we know, it is the only operational GNSS on Earth. In order for GPS receivers to ascertain their present position, time, and speed, it employs a constellation of twenty-four to thirty-two satellites in Medium Earth Orbit to send out pinpoint microwave signals. The NAVSTAR GPS is its formal name. A number backronyms have been made for NAVSTAR, even though it is not an acronym. 0. The 50th Space Wing of the United States Air Force is responsible for managing the GPS satellite constellation. The general public often makes use of GPS for navigational purposes. By precisely timing the signals sent by the GPS satellites orbiting Earth, a GPS receiver is able to determine its precise location. At all times, every GPS satellite is constantly sending out signals that include the time of transmission, exact information about its orbit (the ephemeris), and a broad assessment of the system's health as well as the approximate locations of all GPS satellites (the almanac). To find out how far away each satellite is, the receiver tracks the amount of time it takes for messages to travel through the air. To find the receiver's position, these distances are combined with the satellites' locations using geometric trilateration. Latitude, longitude, and maybe even elevation data are shown with the location, which may be accompanied by a moving map. Direction and speed, which are determined from changes in location, are shown by many GPS systems.

SOFTWARES

The Arduino platform is an open-source, user-friendly hardware and software environment for prototyping. It is comprised of a programmable

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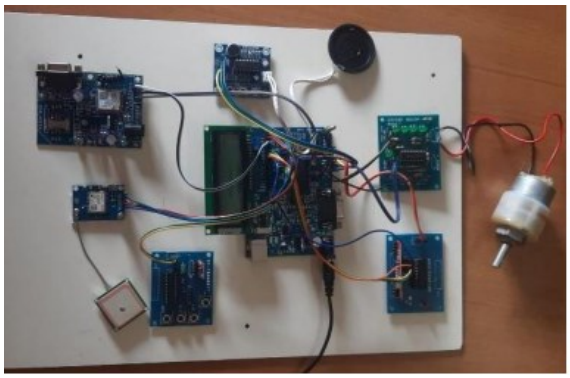
circuit board (also called a microcontroller) and an Integrated Development Environment (IDE) called Arduino that is pre-made for writing and uploading code to the physical board.The main characteristics are:

• Many sensors can send signals in digital or analog formats to Arduino boards, which may then be used to activate motors, control LEDs, establish connections to the cloud, and much more. • The Arduino IDE (also called "uploading software") allows you to command your board's operations by communicating with the microcontroller on the board. • A separate device, known as a programmer, is not required to load fresh code into an Arduino board, in contrast to most prior programmable circuit boards. The usage of a USB connection is all that is required. • The Arduino IDE employs a streamlined version of C++, which facilitates programming learning. Last but not least, Arduino offers a standardized form factor that simplifies the microcontroller's tasks.

Now that we know what the Arduino UNO board is and how it works, we can go on to setting up the Arduino IDE. As soon as we figure this out, we can upload our software to the Arduino board.

RESULTS



CONCLUSION

Enhancing marine safety for fisherman is made possible with the adoption of a border warning system that incorporates GPS, IoT, buttons, and buzzers. In order to avoid unintentional border crossings and other possible dangers, our technology not only guarantees real-time surveillance but also gives fast notifications. The lives and livelihoods of fishermen are safeguarded by deploying these cutting-edge technology, which reduce the hazards of fishing in seas that are contested. Automated distress alerts and weather prediction analytics powered by AI are two potential future upgrades that might significantly improve the system's performance.

REFERENCES

[1]. M. Sivaramaganesh /International journal of innovative research inelectrical, electronics, instrumentation and control engineering vol. 2,issue 3, March 2014.

[2]. K.Prabakaran , A Novel Approach of Geo fencing and Geo taggingSystem

[3]. T. Zhang, S. Liu, N. Ahuja, M.-H. Yang and B. Ghanem, "Robustvisual tracking via consistent low-rank sparse learning", Int. J.Comput. Vis., vol. 111, pp. 171-190, Jan. 2015.

[4]. Z. Kalal, K. Mikolajczyk and J. Matas, "Learning-tracking-detection",IEEE Trans. Pattern Anal. Mach. Intell., vol. 34, no. 7, pp. 1409-1422,Jan. 2018.

[5]. L. Bertinetto, J. Valmadre, S. Golodetz, O. Miksik and P. H. S. Torr,"Staple Complementary learners for real- time tracking", Proc. IEEEConf. Comput. Vis. Pattern Recognit. (CVPR), pp. 1401-1409, Jun.2016.

[6]. Manikandan et al., Bus Identification System For Visually ImpairedUsing Zigbee Technology in IEEE International Conference onCommunication, Computing and Internet of Things, 2022

[7]. G Premalatha et al., Implementation of VLSI Based Efficient LosslessEEG Compression Architecture using Verilog HDL, in Journal ofPhysics: Conference Series. Vo.1964 No.6 2021

[8]. Manikandan et al., ESP 8266 Indoor Based Localization system in2023 Intelligent Computing and Control for Engineering and Bussinesssystem , 2023