Smart Border Cross Detection

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A B S T R A C T

We often find illegal immigrants moving from one country to another. On the ground these illegal immigrants who travel by telephone cut border crossings and go to another part of the world. Even our soldiers looked intently at the border lines for some time as the attackers passed by with ropes. We have come up with a solution to build a machine that sense the presence of illegal immigrants. The device is mounted above the fence line boundaries. If an illegal immigrant passes by or breaks down the fence this device will immediately hear and alarms will sound. On this device also the land they enter through their movement using the IR sensor. Not onlydoes the alarm go off and it transmits the signal to the marching soldiers and camera which takes a picture of intruder and sends that image to the soldiers. The assailant will be arrested by the camp soldiers.With this call we can warn our soldiers to take safety measures and our country will be safe.

1. Introduction

The discovery of illegal immigration and the discovery of automated carriers pose a number of challenges to the military. Until recently, the computer processing power required for thesetasks was expensive and often difficult to ship in the wild or in cars. However, with the advent of small, powerful computers, military acquisition challenges can be worked out in a less expensive way.Illegal immigrants pose a threat to India's security. A few years back, the Border Indian Border force tried to control the illegal entry of people. Due to the increasing size of the Border Security function, it has become increasingly difficult to monitor all aspects of the border at all times. Factors contributing to this situation are the extent of the limitations and strategies for creating illegal immigrants such as building tunnels and building undergroundroutes to bypass existing security measures.

Although some automated border monitoring systems are available, Border Patrol simply don't have power to monitor all parts of the border at all times. In addition,existing systems are more expensive and many traditional methods, such as telephone, have proven to be ineffective.Therefore, a border monitoring and tracking system should be developed. This app should automatically and notify post-border posts, without requiring anyone to watch live video feeds at all times. For this notification to be effective, it must be done in a timely manner, as immigrants who drive a car or a speeding boat across the border travel faster. In addition, when combined with infrared cameras, the system should be able to detect underground channels with changes in ground temperature.

1.1 Proposed Work

We have made a device which will detect the illegal immigrants passing through the border. The device will detect them and also send us the signal and message through the server to theuser's telegram accounts. If anyone near the IR sensor the cam will detect it and also takes a photo it and sends to the telegram.

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2. Literature Survey

In this paper they said There is considerable research in these areas Object detection, tracking and computer focus. Some of these systems are relatively well suited Real-time execution and namely. Often there are limits. Furthermore, commercial Systems are being developed for illegal immigrants Identification and tracking; However they are many Expensive and still contains human material Classification. This method is good in object detection. The evolution of their learning ability is an inherent Complexity is very computationally expensive. For real-time applications like high-speed Automated driving.Comparing feature sets with feature vectors is also a usual method, as in [2]. Such a method Usually there is a large database of feature vectors and matching algorithm. Again, the computational complexity of these components is too much to use in required applications. Millisecond decision times. However it is Difficulty in accurately determining existing distances. Critical for automated driving and border crossing Identity.Nerve networks have also been applied Object detection and tracking problem, but they are still very computationally difficult to train Complicated for high- speed execution.

Regular people additionally remain to profit by vehicle mechanization. Car accidents are an every day event in the United States and cost Americans more than $130 billion every year. Without a few type of one or the other fractional or complete vehicle computerization, mishaps will keep on expanding as a aftereffect of a developing populace that is upheld by maturing foundation. Further, even without foundation restrictions, helpless street conditions brought about by day off ice ordinarily lead to spin-outs. Also, in dry conditions, expressway crises, for example, creatures and alcoholic drivers withdrawing their path make indistinguishable turn out circumstances at higher velocities.

In contrast to individuals, PCs don't get worn out, alcoholic, or on the other hand neglectful and can react to inputs rapidly. This paper proposes and computerized dynamic framework utilizing picture preparing strategies to decide if a vehicle is losing control. Further, a similarnumerical cycle is applied to the issue of illicit worker recognition.Not with standing unlawful settler recognition, mechanized and semi- computerized vehicles are of esteem for both military and regular citizen applications. In military applications, mechanized vehicles guarantee minimal effort protection and reconnaissance frameworks. Further, mechanized, self- exploring robots are significant for identifying bombs and other potential dangers.

3. Description of Components

3.1 ESP 32 Cam:

ESP32-CAM could be a development board module with a size of 27×40mm. It will be integrated into a camera system with an ESP32 module and camera. ESP32-CAM may be widely utilized in various IoT applications. it's suitable for home smart devices, industrial wireless control, wireless monitoring, QR wireless identification, wireless positioning systemsignals and other IoT applications. it's a perfect solution for IoT applications.ESP32 could be a progression of minimal effort, low-power framework on a chip micro-controllers with incorporated Wi-Fi and double mode Bluetooth.The ESP32 arrangement utilizes a Ten- silica Xtensa LX6 microchip in both double center and single- center varieties and incorporates worked in radio wire switches,RF balun, power enhancer, low-commotion get intensifier, channels, and force the board modulesESP32 is created andcreated by Espressif Systems, a Shanghai-based Chinese organization, and is fabricated by TSMC utilizing their 40nm process. it's a replacement to the ESP8266 micro-controller.

3.2 IR Sensor:

The IR sensor module consists mainly of the IR transmitter and receiver, the signature arrow, the resistance (trimmer pot) and therefore the smaller LED output. IR-LED emits light withinthe often ness range. IR light is invisible to us because its wavelength (700nm - 1mm) is way beyond the light limit. IR LED's have an approximate light emission angle. 20-60 degrees andapprox. From some centimeters to many feet, it depends on the IR transmitter and also the manufacturer. Some transmitters have a variety of kilo-meters. The IR LED is white or transparent, so it provides maximum brightness.An infrared sensor is an instrument that's utilized to detect certain attributes of its environmental factors. It does this by either emanating or identifying infrared light. Infraredsensors are likewise equipped for estimating the heat being discharged by an item and recognizing movement.
Infrared waves don't seem to be obvious to the natural eye. within the electromagnetic range, infrared emission is found between the apparent and microwave districts. The infrared wavescommonly have frequencies somewhere within the range of 0.75 and 1000µm.

3.2TTL Convertor:

USB TTL serial cables range from USB to serial converter cables, providing connectivity between USB and serial URT interfaces. There are many cables available that provide connectivity at different user-specific signal levels with 5V, 3.3V or different connector interface.TTL is particularly suitable for bipolar integrated circuits because the additional inputs to the gate require additional emitters in the shared base area of the input transistor. If individually packed transistors are used, the cost of all transistors will be discouraged from using such an input structure. Time-to-Live (TTL) is the value in the Internet Protocol (IP) packet that tells the network router whether the packet has been in the network for a long time. In IPv6, the TTL field is changed to the Hope limit per packet. Most PCs and work areas presently don't have sequential ports, yet numerous improvement sheets require a sequential port for investigating, comfort interface, or even programming download. The sequential ports on improvement sheets generally give "rationale level" flags instead of RS-232 sequential port signs.
This implies that there's no simple method to associate an improvement board to a PC. The USB to TTL converter tackles this issue by giving a sequential port association between a host PC and an advancement board, with the right interfaces and sign levels for each. Subtleties beneath.

A TTL Signal is a sort of equipment interface standard dependent on the electrical properties of TTL (Transistor- Transistor Logic).For a TTL input this implies that anything beneath 0.8 volts is a "zero" and anything above2.4 volts is a "one," and that it presents a heap of under 1.6ma to the driving circuit. A TTL yield can regularly drive ten TTL information sources, and still keep up the right voltage levels for "zero" and "one."The name USB to TTL converter is a truly downright terrible. It abuses the term TTL, and misuses the term converter. Confounding, correct?

The alleged USB to TTL converter is really a USB Serial Port to CMOS Logic-Level Serial Port converter. It has two finishes: a USB connector, and four wires made to join to terminal posts. It contains a chip that is ready to fool your PC into deduction a sequential port is introduced.

You plug the USB port into your PC, and it appears to your PC as another sequential port. It utilizes standard PC USB sequential port gadget drivers. You associate the four wires up to control, ground, sequential RX and sequential TX on an Arduino or other advancement board, these signs utilize the right voltage levels for the improvement board as opposed to customary RS-232 levels, and it appears to your Arduino that something is conversing with it over its sequential port.

4. Working

We have created a Telegram bot for ESP32 Cam which is interfacing with the server. We can know the commands using "/start".It shows the what are all the commands in it.The ESP32-CAM will only respond to message coming from your Telegram account ID.This device is controlled by the telegram application. We created the telegram bot or channeland after creating the channel all the soldiers and the officers will be added to that telegram channel. The all soldiers and officers are added to the telegram channel. There will four commands to control the device. Anyone who is added into the channel can access those commands. By accessing those commands they will get the required information of what's happening at the fence and border line.If they don't know what are the commands are there to know the information or to control thedevice they can know by typing a command called **/start.**

There four commands are as follows:

1. **/photo**: takes a new photo
2. **/flash**: toggles flash LED
3. **/person_de**t: person detection
4. **/fencing_stat**e: fencing data is safe
5. **/start**: to know what commands are there

The above commands are to interact with the ESP32-CAM through telegram bot or channel.In our prototype we have used jumper wires in place of fencing. if anyone give

/fence_state as command – it sends us "fencing data as follows: 1 or It send us " fencing Data as follows:0 ". Here 1 and 0 is used for our quick understanding purpose. "1" means safe (fencing is notbreaker or not cutted). "0" means means unsafe(fencing is breaked or cutted).

IR sensor is used for the detection or object detection. If IR sensor detects anyone it will send us the information and detected person's photo(spot photo).If anyone give

/person_det as command – it sends us "person detected sensor data is: 1 Or It sends us "person detected sensor data is: 0Here 1 and 0 is used for our quick understanding purpose. "1" means safe (no person detected)."0" means unsafe (person detected).IR Sensor used for instant photo.

The /flash command is used for the night vision. During night we don't have light so in nighttime if anyone crosses the fence if the IR sensor sense that then it will detect send us the message and takes the snap shot of the person and send it in telegram.

TTL Converter is used to convert the USB data into UART protocol. Entire device is controlled by telegram and TTL converter place a vital role in the transfer and receiving the information.

5. Conclusion and Future Scope

In this paper we have made a device which detect the Image Capturing. Experimentation shows success of the project and to illegal image processing. The hardware requirements for the device is very low. The device depends on the Wi-Fi range. By using this device we can warn the soldiers in order to take safety precautions and our country will be in safe. Future work will include the video surveillance and Object tracking.

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