

Animal Intrusion Warning System Using IoT

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ABSTRACT: Wildlife intrusion in areas with high human mobility is proved to be lethal for both human beings and animals. The surveillance and tracking of the wild animals are difficult due to their size and nature of movement. Thus, this proposed system seeks to detect wild animals that disturb the human life and the agricultural fields with the aid of a PIC microcontroller. At the heart of the intrusion detection system is the PIC 168F77A microcontroller that transmits pulses at 38 KHz. It is suitably interfaced to a WI-FI module that can send message on sight of infringement. The proposed system is tested with animal database and if the wild animals are detected, then the messages are sent to the webpage of the mobile. The proposed system endeavors to prevent casualties that occur in areas having high human wild animal's interaction.

KEYWORDS: PIC 168F77A microcontroller, Arduino Nano, WI-FI module, Buzzer.

I. INTRODUCTION

Animal detection may be a vital and rising space attributable to an outsized range of world applications. Numerous animal detection ways and warning systems area unit used for indicating the presence of animals on the roads or residential district. Applications that area unit vital in world area unit preventing animals bumping into vehicles on roads, preventing dangerous animal intrusion in residential district, knowing locomotive behavioural of targeted animal etc. of these applications is narrowed right down to 3 areas particularly detection, trailing and identification of animals. Now safety of each human and animal is equally vital. We'd like to implement some reasonably warning system to create positive human and wild animals live safely.

This has 2 halves: one wherever humans ought to get notification whenever wild animal comes close to residential district and different part is to stay wild animal removed from human while not harming them. Our project intends to resolve these problems. There are a unit range of villages that area unit located close to the forest space, thus there's risk ahead of individuals from wild animal. Therefore we have a tendency to area unit victimization passive infrared sensors to sense the temperature and motion of animals to notice the encroaching. Animal detection primarily based researches area unit helpful for several world applications. Animal detection ways area unit useful on the analysis associated with locomotive behavioural of targeted animal and conjointly to stop dangerous animal intrusion in residential district. In agricultural field the attacks of animals and birds is performed by victimization sensors to notice the encroaching of animals and birds. Whereas animals trespasses a message is shipped to the owner or the one checks on the sector relating to the trespass and this permits alertness and that they will defend their filed being destroyed. Within the case of birds it's solely necessary to make acoustic sounds once it detects the arrival of birds. Birds get irritated to the acoustic sounds and can move removed from the sector. Within the existing system the acoustic sound is formed regularly and therefore the birds might get custom-made to those sounds because it hears it regularly and often. However within the system wherever the sound isn't continual and it's made throughout the arrival of birds it gets considerably irritated because it may be a sudden and aggravating voice. Once a bird arrival is detected it's not necessary to send messages to the various persons. It mechanically starts up the effect through the committal to writing connected to acoustic sound generator. In this system therefore the animals and birds that area unit encroaching in forests and therefore the agricultural fields is detected. The detection provides info of the encroaching to the various

persons like forest ranger on duty, head of the village, any native news channel, within the agricultural field the owner of the sector etc. This info passing makes individuals aware and will help take precautions and thus can stop the destructions caused by them.

II. RELATED WORK

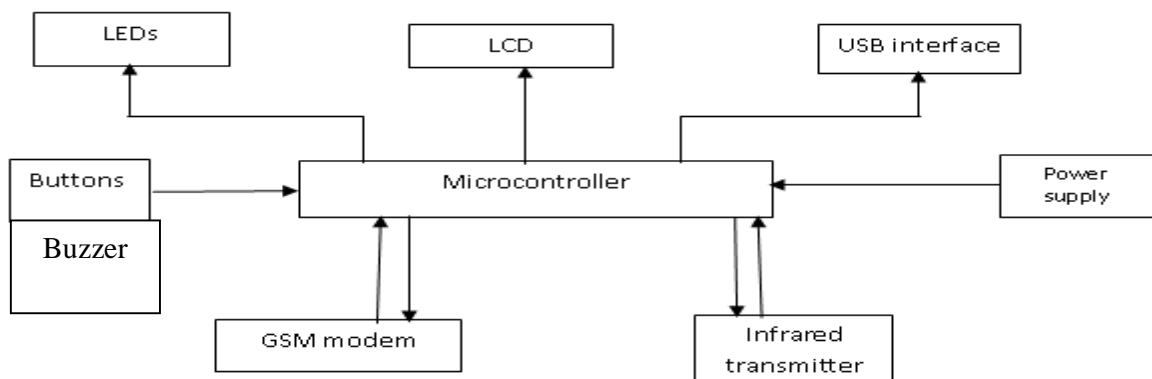
Researches on Animal Detection by Human Eyes:

Early researches on animal notice ion area unit to look at how briskly human eyes will detect the presence of animal in area. Animal detection by human eyes has been thought of because the most reliable detection technique if seen from the machine purpose of read. This is often as a result of the image structure in natural pictures is extended. It is found that a person's observer is in a position to come to a decision whether or not an in short flashed associate degreeimal scene contains an animal as quick as 150ms. Median time interval results indicate a speed accuracy of ninety two paces for time interval of 390ms and increase to ninety seven percent of correctness for 570ms. Tho' human detection is effective and succeed satisfactory level, human eyes will simply get tired inflicting decreasing of effectiveness. Moreover, human eyes cannot work twenty four hours on a daily basis to perform animal detection.

Researches on Power Spectral:

The researchers even have tried to seek out whether or not the presence of animal within the image scene cans amendment the facility spectral of the image or not. The facility spectral is outlined because the amplitude of the signal within the frequency domain. This may be created by reworking the photographs from spatial domain into the frequency domain, by victimization remodelation perform like the Fourier transform. The most plans are to assist the human observer to appreciate the presence of the animal within the scene by inspecting the facility spectral. The human observer won't value more highly to use this approach if they need to quickly notice the animal.

III. INTRUSION DETECTION SYSTEM BLOCK DIAGRAM DESCRIPTION



The entire circuit consists of different blocks or sub-units with each block performing an essential function. The sub-units are interconnected to give the complete system. The different blocks that make up the system are described in details below.

The 7805 is a 5V regulator which ensures an output of +5V and it is connected to the microcontroller. The LM317 is a variable regulator. Its output voltage is varied by varying the 5K Ω variable resistor until the desired voltage is gotten. In this circuit, it is used to provide the needed +12V for the relay power supply. The four

diodes, D1 to D4, rectify the ac voltage from the transformer to dc voltage. The capacitor, C1, smoothen\filters the rectified voltage so as to remove ripples. The Transformer, TR1, steps down the ac voltage from 220V ac to 15V ac.

IV. THE PIC16F877A MICROCONTROLLER

This is the heart of the Intrusion detection system. The PIC16F877A microcontroller is used. Its presence minimizes component count required to get the circuit working. It also authenticates the device as an embedded electronic system. The pins in the microcontroller are grouped into ports. Hence, we have PORTA, PORTB etc. Figure 3.3 shows the arrangement of a 40-pin PIC 16F877A microcontroller.

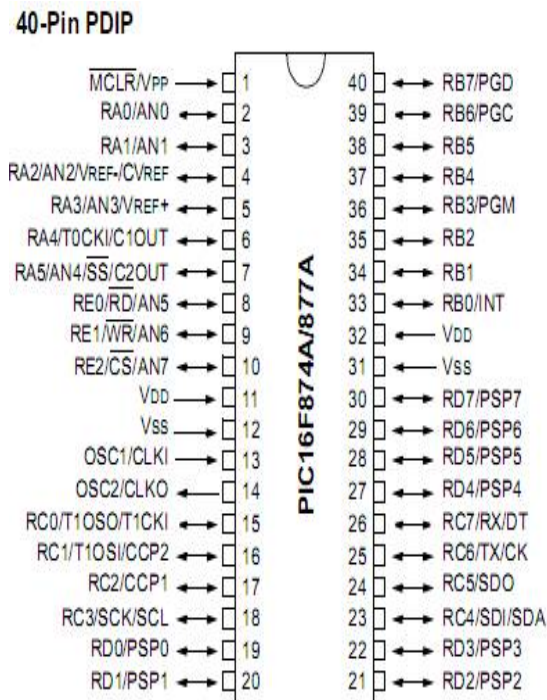


Fig 1 PIC16F877A Microcontroller

V. POWER SUPPLY SUB-UNIT

Every electronic system requires ac power supply to work. The quantity of voltage and current required by each component is specified in its datasheet. Most electronic components and sub systems operate on +5V. This voltage (+5V) is a basis for electronics power supply. The datasheet of the components used in the intrusion detection system also specify a power supply voltage of +5V except for that of the relay which works with +12V. Figure 3.2 shows the power supply sub-unit and its various components.

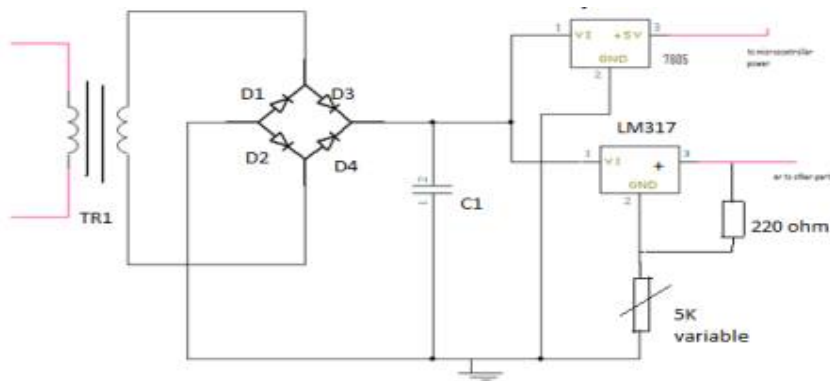


Fig 2 Power Supply Sub-Unit

VI. INTRUSION DETECTION SYSTEM CIRCUIT DIAGRAM

The interconnections of the various components form the complete circuit diagram which was used to achieve our access control. The PIC 16F877A Microcontroller transmits and receives infrared pulses at 38 KHz at no line of sight infringement and obstructions. As the Camera USB cable is connected to a laptop, the camera software is run. The LCD, LED and microcontroller are interfaced to inform the user on the situation report. Subsequently, the buttons instantly switches ON the camera to enable the webcam take snapshots and save the pictures.

When powered on, the LED power indicator flashes or comes ON.

The various sub-units discussed were combined to realize the complete circuit diagram shown in Figure below,

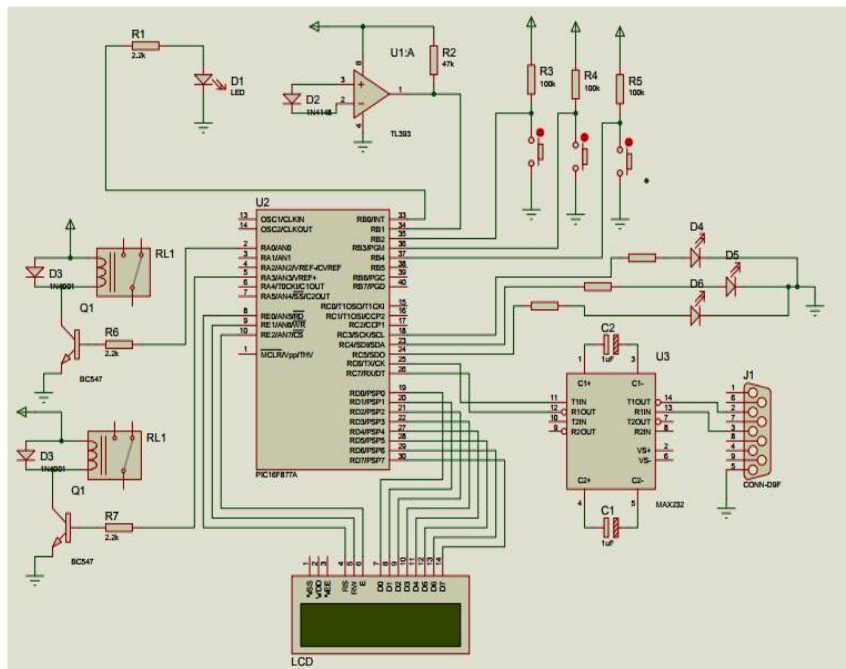


Fig 3 Intrusion Detection System Circuit Diagram

VII. FLOW CHART DESCRIPTION

Figure 4 is the operational flow chart which shows the overall description of how the entire system works.

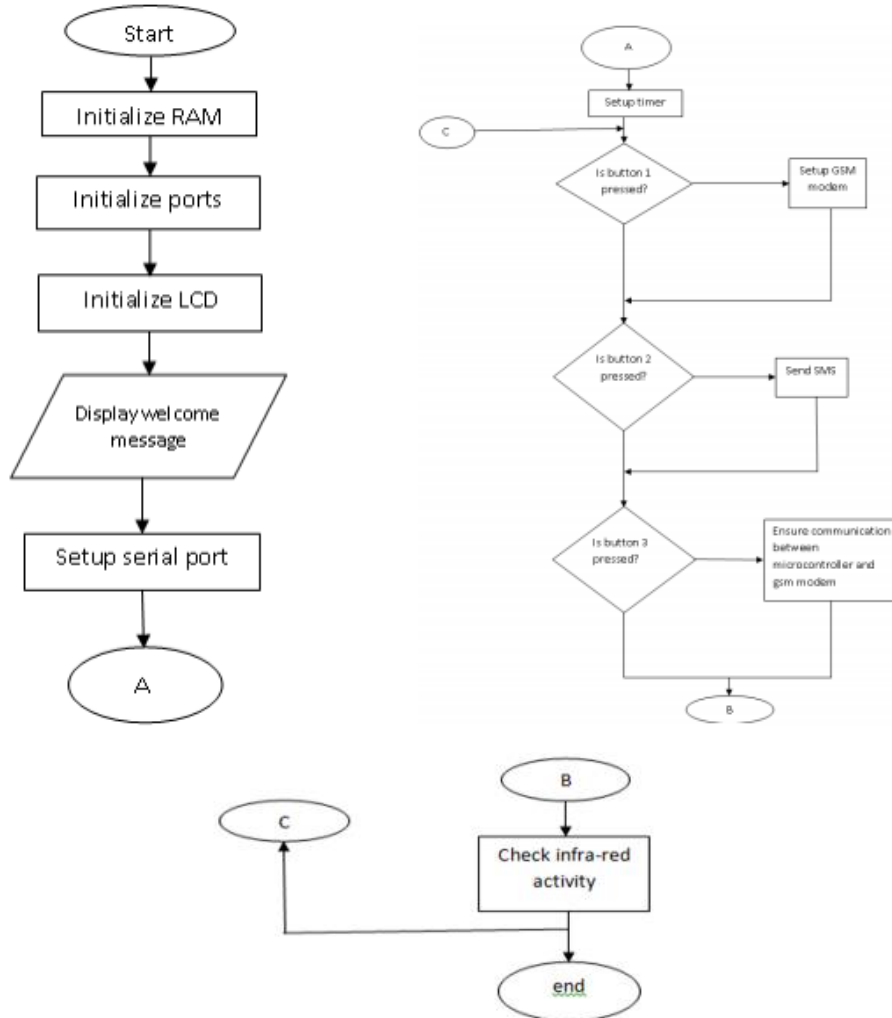


Fig 4 System operational Flowchart

VIII. CONCLUSION

Thus, novel technique to detect dangerous wildlife i.e., the elephants, tigers and monkeys in order to prevent Human-wildlife Collision were proposed in the paper. The main focus of the future work will be to develop a faster method to cover large area of land. With a greater training dataset, the efficiency for the wildlife detection system is likely to increase. The detection and tracking of motion of multiple or groups of animals will also be an area of focus in the future studies.

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