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INNOVATION TOWARDS COMMUTE SAFETY AND SAVE FOREST

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Abstract: Main aim of the Image processing project is to extract important data from images. Using this extracted information description, interpretation and understanding of the scene can be provided by the machine. Main point of image processing is to modify images in the desired manner. This system allows users to input images of forest land, animals and live fire so that the system can detect the ratio of deforested land in the forest, identify animals and detect fire and notify the concerned person. In other words, image processing is called as altering and analyzing pictorial information of images. In our daily life we come across different types of image processing. The best example of image processing in our daily life is our brain sensing a lot of images when we see images with eyes and processing is done in very less time. In the existing system there are many techniques which are available for extracting information from images but there is no exact processing is defined. In the proposed system we will come across a tensor flow and cv2 based model for detecting forest fire and animals, and also to calculate deforested land. And also, we are building an Arduino based artificial pond for conserving rain water inside the forest, this model also preserve water from evaporating by letting a sun board closed every time when there is no movement near the pond, and automatically opening the sun board when there is some movement near the pond by using an RF Transceiver.
Keywords: image processing, deforestation, fire detection, animal detection, water conservation, IOT.

I. INTRODUCTION

Save the trees, save the earth. We havea responsibility to save and conserve the resources of nature for present and future generations. Agricultural expansion, wood extraction and urbanization are the main causes of deforestation. To avoid these effects we developed a software for detecting the amount of deforestation using image processing and Infrastructure expansion such as road construction in the forest area affects the wild habitat to protect animals as well as humans from accidents. Forest fires have two ways naturally caused or human caused fire started by spontaneous combustion of sawdust and leaves to detect the fire and take corrective actions we use image processing and to conserve water for wildlife to satisfy their thirst to avoid animals coming out of forest for the need of water.

The technology used here is: A] Digital Image Processing: means processing digital images by means of a digital computer. We can also say that it is a use of computer algorithms,in order to get enhanced images to extract some useful information.Image processing mainly include the following steps:

1.Importing the image via image acquisition tools 2. Analyzing and manipulating the image 3. Output in which the result can be altered image or a report which is based on analyzing that image.

B] Internet of Thing: In the simplest terms, the Internet of Things

(IoT) is how we describe the digitally connected universe of everyday physical devices. These devices are embedded with internet connectivity, sensors and other hardware that allow communication and control via the web. IoT makes once "dumb" devices "smarter" by giving them the ability to send data over the internet, allowing the device to communicate with people and other IoT-enabled things. The connected "smart home" is a good example of IoT in action. Internet-enabled thermostats, doorbells, smoke detectors and security alarms create a connected hub where data is shared between physical devices and users can remotely control the "things" in that hub (i.e., adjusting temperature settings, unlocking doors, etc.) via a mobile app or website. Far from being restricted to just the home, the Internet of Things can be found in an array of devices, industries and settings. From smart blackboards in school classrooms to medical devices that can detect signs of Parkinson's disease, IoT is rapidly making the world smarter by connecting the physical and the digital.

In a nutshell, IoT works in the following way:
Devices have hardware like sensors, for example, that collect data. The data collected by the sensors is then shared via the cloud and integrated with software. The software then analyzes and transmits the data to users via an app or website. Smart devices connect to an IoT platform, described by the experts at IoT For All as "the support software that connects everything in an IoT system." There are hundreds of IoT platforms and some are made by such industry giants as Oracle and IBM.

II. LITERATURE SURVEY

[1] usage of ultrasonic sound generators that could be used to warn stray animals entering the road. Since dogs and animals of similar size can hear ultrasonic sounds that humans cannot. The ultrasonic generator transmits the sound in all the directions and when animals hear this high-pitched sound it gets an alert and leaves the place, through this the accidents can be reduced. • [2] visual scene analysis is a high-level task that acquires knowledge from digital images and videos. Object detection is a field of computer vision and image processing which involves detecting objects of varying class present in images and videos. • [3] R-CNN Is a

type of CNN that is able to locate and detect objects in images: the output is generally a set of bounding boxes that closely match each of the detected objects, as well as a class output for each detected object. Single Shot Detector (SSD) – the task of object localization and classification are done in a single pass of the network. SSD's architecture uses VGG-16 architectures as the base network because of its strong performance in high quality image classification tasks and its popularity for problems where transfer learning helps in improving results, a set of convolutional layers were added, thus enabling to extract features at multiple scales and progressively decrease the size of input to each subsequent layer. • [4] VGG16 is a convolutional neural network model? It is trainedover ImageNet dataset that contains over 15million labelled high-resolution images belonging to roughly 22000 categories. The input image is passed through a stack of convolutional layers, where the filters were used with a very small receptive field: 3x3. In one of the configurations, it also utilizes 1x1 convolution filters, the convolution stride is fixed to 1 pixel, the spatial padding of conv. layer input is such that the spatial resolution is preserved after convolution. • [5] Imaging systems, particularly those on board satellites, provide a repetitive 11 and consistent view of the earth that has been used in many remote sensing applications such as urban growth, deforestation and crop monitoring, weather prediction, land use mapping, land cover mapping and so on. For each application it is necessary to develop a specific methodology to extract information from the image data. To develop a methodology, it is necessary to identify a procedure based on image processing techniques that is more adequate to the problem solution. In spite of the application complexity, some basic techniques are common in most of the remote sensing applications named as image registration, image fusion, image segmentation and classification Imaging systems, particularly those on board satellites, provide a repetitive and consistent view of the earth that has been used in many remote sensing applications such as urban growth, deforestation and crop monitoring, weather prediction, land use mapping, land cover mapping and so on. For each application it is necessary to develop a specific methodology to extract information from the image data. To develop a methodology, it is necessary to identify a procedure based on image processing techniques that is more adequate to the problem solution. In spite of the application complexity, some basic techniques are common in most of the remote sensing applications named as image registration, image fusion, image segmentation and classification. Hence, this paper aims to present an overview about the use of image processing techniques to solve a general problem on remote sensing application. A case study on an urban application is provided to illustrate the use of remote sensing technologies for solving the problem. • [7] The paper presents the capture of an image from the printed media, applied to image processing algorithms to scaling and translation of the image, wipe out the noise, and detect the edges. Then the developed software chops the comics strip along the border into individual units, stores it in permanent memory and display on the handset. The application Graphical User Interface was designed using Qt and Visual C++ Integrated Development Environment (IDE) for implementing image processing algorithms using Open Source Computer Vision Library (OpenCv). Many image processing methods pre-processes images, which are Set Region of Interest (ROI) crop, flattening with Gaussian Filter, RGB to Grayscale adaptation, Histogram equalization and Detect Border. This developed software integrated in mobiles by the cross compilation of Qt and the OpenCv software for Windows XP Operating system. The result utilized the CANNY method in finding edges of the image using OpenCv. [8] In this paper, Imaging systems, particularly those on board satellites, provide a repetitive and consistent view of the earth that has been used in many remote sensing applications such as urban growth, deforestation and crop monitoring, weather prediction, land use mapping, land cover mapping and so on. For each application it is necessary to develop a specific methodology to extract information from the image data. To develop a methodology, it is necessary to identify a procedure based on image processing techniques that is more adequate to the problem solution. In spite of the application complexity, some basic techniques are common in most of the remote sensing applications named as image registration, image fusion, image segmentation and classification. Hence, this paper aims to present an overview about the use of image processing techniques to solve a general problem on remote sensing application. A case study on an urban application is provided to illustrate the use of remote sensing technologies for solving the problem.

III. PROPOSED WORK

- The real time images of the forest are captured or images present in the dataset collected is fetched for pre-processing of data. After capturing these images by using a web camera, convert BGR to RGB using CV2 model. The captured image is blurred using median-blur function. Then, the blurred image which is in RGB form is again converted to gray scale. Set the threshold by specifying values for each area of contour. The total area of each contour is estimated. Then the total area and specified threshold value is compared. If the threshold value which is being set is greater than the actual threshold value, then add total area without blur. And the ratio of deforested land to total forest area along with the latitude and longitude value is displayed.
- First the mobile net SSD is loaded into the program and then the video is captured in real time and that is stored and extracted in frames for pre-processing of data. After capturing these frames by using web camera, the frame is resized and the frame is converted into BLOB format , then input blob to the network and then computed the forward pass for the animal detection and prediction and this detections are stored in a array variable , then we loop over that array to detect the low confidence predictions and filter them and then draw the bounding box on the animal predicted and the class of prediction is

displayed on the console and a notification is sent to the phone. We are using Mobile Net-SSD (it is a caffe implementation of Mobile Net-SSD detection network with pretrained weights on VOC0712 and mAP=0.727).

- The IR sender and IR receiver are placed opposite to each other, and the ground and vcc is connected to the IC 7805 for power usage and the data pin is connected to the Arduino. So when there is any obstacle between the IR sensor, the IR receiver receives the signal and triggers the servo motor to open up the pond covering. The servo motor is connected to the Arduino, which sends a signalto the servo motor to rotate the lid covered on the pond. The pond is connected with two wires, among them one is connected to the bottom of the pond and another one is 8 connected to the top, based on the values of these two wires we control the water level of the pond. And when the water level in the pond has reached low then the water pump inside the tank is triggered through a relay by the Arduino.

IV. EXISTING METHOD

Sign Boards about the presence of animals in the area, slow down, be alert, look ahead. If you see an animal on the road approach slowly, be prepared to stop; do not rev the engine or sound the horn as this is likely to startle the animal and could cause damage to vehicles. The main reasons attributed to the reduction of forest cover are shifting cultivation, rotational felling, other biotic pressures, diversion of forest lands for developmental activities, etc. Various steps, rules and laws have been brought and implemented in order to conserve the forest, which are almost always ignored by the civilians. The naturally available ponds, lakes, rivers, and falls are the only means of water inside forests available for animals. The government has made policies for forest fire prevention and avoidance. The government has policies to avoid materials that are cause for the forest fire and are applying a ban on allowing such materials inside the forest.

LIMITATIONS OF THE EXISTING SYSTEM

- The existing rules and regulations imposed by the government are not being followed by some citizens.
- Some people don't follow the warning given through sign boards while driving vehicles around forest land.
- Illegal cutting of trees for their advantage is not being exposed.
- Unpredictable climatic changes which are causing very hot weather causing drought.

V. CONCLUSION AND FUTURE WORK

The proposed system is developed using Python3 for image processing and Arduino embedded code for hardware. This application is a system to store and save rain water by automated movement of storage covering and calculating the deforested land and indication of animal movements around forest borders. In future, this application can be enhanced in the following ways: All these modules can further be integrated in higher processing machines and forests can be monitored to avoid illegal activities and to enhance biodiversity. And also we can enhance the model to identify ponds near fire detected areas, so that we can use the water in ponds to extinguish forest fire.

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