# SWE3999-TECHNICAL ANSWERS FOR REAL WORLD PROBLEM

# PROJECT REPORT

## ANIMAL INTRUSION DETECTION SYSTEM


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**SUBMITTED TO**

**----------**

**SCHOOL OF COMPUTER SCIENCE AND ENGINEERING**


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(Deemed to be University under section 3 of UGC Act, 1956)

# DECLARATION

We hereby declare that the project entitled ‘Animal intrusion detection system submitted by us to the School of Computer Science and Engineering, Vellore Institute of Technology - Chennai Campus, 600 127. In fulfillment of the requirements of the award of the course of SWE3999 - Technical Answers for Real World Problems (TARP) is a bona-fide record of the work carried out by us under the supervision of Dr. Nithya Darsini S , Dr. Geetha S and Dr.Asnath P .

Place: Chennai

Signature of the students

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# CERTIFICATE

This is to certify that the report entitled 'Animal intrusion detection system' prepared and submitted by Vishnu S Mani- 18MIS1016, Abinaya Sruthi-18MIS1028, Syed Shuheb-18MIS1041,Suraj G-18MIS1050 Suresh Kanna P - 18MIS1067 and Prasanna M-18MIS111 to Vellore Institute of Technology - Chennai Campus, In fulfillment of the requirements of the award of the course of SWE3999 - Technical Answers for Real World Problems (TARP) is a bonafide record carried out under my guidance. The project fulfils the requirements as per the regulations of this University and in my opinion, meets the necessary standards for submission. The contents of this report have not been submitted and will not be submitted either in part or in full, for the award of any other degree or diploma and the same is certified.

GUIDE:
Dr.Geetha S
Dr.Nithyadarsini
Dr.Asnath

HEAD OF THE DEPARTMENT:
Dr Asnath Phamila Y

DATE:15-12-2021

# ACKNOWLEDGEMENT

We are profoundly grateful to Dr.Geetha S, Dr.Nithyadarsini and Dr.Asmath for their expert guidance and continuous encouragement throughout to see that this project rights its target from its commencement to its completion.

We would like to express our deepest appreciation towards Vellore Institute Of Technology Chennai and once again to ,Dr Asmath Phamila Y, Head of the Department of Software Engineering whose invaluable guidance supported us in completing this project.

At last, we must express our sincere heartfelt gratitude to our friends and seniors who helped me directly or indirectly during this course of work.

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# ABSTRACT

Our solution to the problem is to build an animal intrusion detection system that alerts the user of sightings of animals in real time if it has entered the village or locality. We plan to achieve this by training the model with a Mask RCNN algorithm.

Which is fed animal photos with labeling.This will enable the model to detect and recognize an animal. In this project we will be concentrating on a single species of animal like elephant.

Since elephants are poached on the regular basis for the trading, meat, tusks, industry and the entertainment uses, it is necessary to take required precautions and the prevention measures to save the elephants from the poaching and the species like elephant to prevent it from the extinction

Detecting animal intrusion using image processing will help the system to send out an alert to the residents nearby and take precautions. This kind of real time alert can avoid animal accidents and also can help the residents take quick actions to solve the situation.

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# INTRODUCTION:

With the rapid increase in deforestation and depletion of ecosystems, animals are finding it hard to live in their natural habitat, there are numerous incidents that take place where animals get out of their enclosure in search of food.

These incidents almost always end with the animals getting hurt due to the voluntary action by the humans or by the animals getting in the middle of dangerous human activity. So, we came up with the idea of creating animal intrusion detection using image processing as a solution.

With growing security systems, it is easy to find CCTV cameras in every establishment. Even if there are no cameras, installing one does not cost you much. These optical systems capture intrusion and will alert the user accordingly. Detecting animal intrusion using image processing will help the system to send out an alert to the residents nearby and take precautions. This kind of real-time alert can avoid animal accidents and also can help the residents to do the needful.

# 1.OBJECTIVE AND GOAL OF THE PROJECT:

The main objective of the project is to prevent the human and animal conflict and safeguard the agricultural field and from attacking domestic animals and wild animals and also to protect them by driving them away instead of killing. We are using an integrative approach in the field of Image processing to provide a monitoring and repelling system for crop protection against animal attacks and to prevent the conflicts.

Camera is used to capture an image and the video of a wild animal and send the captured image to the Image Processing module. In this project, we have used the machine learning model which is trained using the Mask RCNN algorithm, then the video is captured frame by frame. If the animal is detected in the video , we will be receiving a warning message via call, which is implemented with the help of Twilo. Basically it is a communication API which is used to send SMS, Voice and Video alerts .

## 1.2 PROBLEM STATEMENT:

With rapid increase in deforestation and depletion ecosystems animals are finding it hard to live in its natural habitat, there are numerous incidents that take place where animals get out of their enclosure in search of food.

These incidents almost always end by the animals getting hurt due to the voluntary action by the humans or by the animals getting in the middle of a dangerous human activity. So, we came up with the idea of creating an animal intrusion detection using image processing as a solution.

With growing security systems, it is easy to find cctv cameras in every establishment. Even if there are no cameras, installing one does not cost you much. These optical systems capture intrusion and keep your belongings safe. But along with capturing intrusion it can also be made to detect animal or human intrusion.

Detecting animal intrusion using image processing will help the system to send out an alert to the residents nearby and take precautions. This kind of real time alert can avoid animal accidents and also can help the residents take quick actions to solve the situation.

## 1.3 MOTIVATION:

Over the years its been observed that one of the major reasons for elephant deaths after, dehydration and starvation is accidents and injuries. The society has failed to recognise this as an alarming issue and take necessary and efficient measures to prevent such accidents or injuries. Almost majority of elephant fatal accidents involve human-animal interaction. These interactions when not handled properly can cause damages on both ends. Thus, the driving force behind this project is to propose an efficient method for detecting the elephants(can be trained for other animals) in the recognised entry points (elephant corridors) and alert the authorities and the general public to encourage preparedness to handle such situations in a sensitive manner and cut down the damages as much as possible.

### 1.4 CHALLENGES:

One of the very important factors that affect  that can be viewed as a shortcoming or can pose as a challenge is the placement of the camera. Assuming for a forest region, the cctv cameras will be mounted to poles that will be placed a certain distance apart from one another, covering the targeted region. This can get a little tricky as, when the wild animal gets detected in the camera and before the authorities are alerted about same, chances of preventing any potential damages reduces to a larger extent as there is almost no reaction time. Hence the placement of the cameras at a certain distance ahead of the border becomes important to give more time for the authorities to react and to actually prevent any potential damages. Other factors that can be viewed as a shortcoming are technical level dependent on the camera specifications and other components. The alert module, that includes sending an alert message to the authorities in text/call format needs a ceratin reaction time.This shortcoming can be eliminated by adding another alert component for immediate reaction or an on ground response. This can be in the form on inducing bright light or generating irritating noises that can drive away the animals but the affect of these measures on the animals needs to be studied thoroughly.

# 2. LITERATURE SURVEY

**1. Mark O. Afolabi, Idowu and A. Olalekan, "Design and Implementation of Farm Monitoring and Security System", International Journal of Computer Applications (0975 – 8887) Volume 181 – No. 9, August 2018**

In this Project, the author proposed an alarm system which mainly scares ruffians to leave the field. If the ruffian is present for more period by GSM message is sent to glazier by saying that some ruffian or fowl is in the field. The other attribute is that metallic sensor which provides information to glaze those who invade the field.

**2. S Jeevitha and Dr. Venkatesh Kumar, "A Review of Animal Intrusion Detection System", International Journal of Engineering Research & Technology (IJERT) Vol. 9 Issue 05, May-2020.**

In this Project, the author proposed an animal intrusion alert system that can be used with wireless sensors and sends an automatic alert message to the landowner also to forest officials with an image. This can make early warning notification to take a suitable action depending on the type of intruder. The sensor will detect the movement of the animal and the camera will capture the image, using image processing techniques the captured image

is classified via a microcontroller, then GSM module will send the alert notification SMS to the forest department or the landowner.

**3.Saieshwar Radhakrishnan, Ramanathan.R, "A Support Vector Machine with Gabor Features for Animal Intrusion Detection in Agriculture Fields", 8th International Conference on Advances in Computing and Communication (ICACC-2018)**

In this Project, the author proposed an animal intrusion detection system based on image processing and machine learning approach. The image of an animal is segmented using a watershed algorithm to extract various objects in the image and to examine that if any threat animal is found in segmentation. This algorithm is to create a barrier which is the contour only when the marked region meets different markers. Gabor filter is extensively used in extracting a region with text to recognize facial expression in various frequencies. Linear SVM is a supervised learning algorithm to train the dataset and to classify text and hypertext. This method of animal intrusion detection achieves an overall average of around 54.32%.

**4. K. Jai Santhoshi, Bhavana. S, "Intruder recognition in a farm through wireless sensor network", International Journal of Advance Research, Ideas and Innovations in Technology et al 2018 (Volume 4, Issue 3)**

In this Project, the author proposed intrusion recognition in farmland through a wireless sensor network (WSN) technology. The motion sensor is placed at various locations to sense the movement and communicate to the organizer via Radio frequency transceiver. The detection raises then the organizer sends an alert call to the farm owner mobile through the Global System for Mobile (GSM) module. An Arduino board is fixed near the centralized sensor and the GSM module will be the interface along with buzzers and RFID transmitter. To differentiate authorized and unauthorized entries in farmland Radio-frequency identification (RFID) tags are used.

**5. Sahane Pradnya Sambhaji, Salunke Nikita Sanjiv and Shirsath Vitthal Somnath, "Early Warning System for Detection of Harmful Animals using IOT", International Journal of Advance Research and Innovative Ideas in Education Vol-5 Issue-3 2019**

In this Project, the author proposed an IOT based harmful animal early warning system. First, stored the harmful animal database in the computer system or cloud which is already connected to the IoT model with various sensors. Images are captured with a web camera only if any movement of animals is found in the school area, the computer system will compare the moving image with stored database image and trigger the Arduino Uno for the programming process. It buzzes the alarm and also sends SMS on a user's mobile phone after the animal is detected.

**6. Sheela., Shivaram. K. R, Chaitra, Kshama, Sneha , Supriya, "Low Cost Alert System for Monitoring the Wildlife from Entering the Human Populated Areas Using IOT Devices" International Journal of Innovative Research in Science, Engineering and Technology Vol. 5, Special Issue 10, May 2016**

In this Project, the author proposed a low-cost alert system to monitor animals using IOT devices. The PIR sensor tower consists of a Raspberry Pi module which is connected to a USB camera to capture images at the time of motion is sensed and sends images via a web server using the internet. For image processing OpenCV is installed on raspberry pi also in this paper, to reduce the cost of electric lines solar power is fixed in each sensor tower the solar panel will charge the battery from the sunlight and provide power to the sensor tower. This provides power consumption low and stores battery power even at night.

**7. Tibor TRNOVSZKY, Patrik KAMENCAY, Richard ORJESEK, Miroslav BENCO, Peter SYKORA, "Animal Recognition System Based on Convolutional Neural Network", ADVANCES IN ELECTRICAL AND ELECTRONIC ENGINEERING VOLUME: 15 | NUMBER: 3 | 2017 | SEPTEMBER**

In this Project, the author proposed an animal recognition approach based on CNN. To minimize the effect of factors the input image can be treated with a series of pre-processing techniques. A well-known image recognition method is used to recognize computed phases such as Principal Component Analysis (PCA), Linear Discriminant Analysis (LDA), and Local Binary Pattern Histograms (LBPH). Proposed CNN and SVM classification methods have successfully identified animal faces from the created animal database, Convolutional Neural Network (CNNs) are a category of Neural Networks that have been more effectively recognized animal faces than SVM classifiers. CNNs achieves overall best precision accuracy of 97%, various tested methods were implemented in MATLAB and C++/Python Programming language.

# 3. REQUIREMENT SPECIFICATIONS:

## 3.1 HARDWARE SPECIFICATIONS:

We have kept the hardware requirements to minimum to minimise the complexity of the system and also to make the project economically feasible.

1. **Main System**
   The computer's required specification will depend on the the number of optical sensors it needs to handle.
   In our case the system's specification was:
   - Ram : 16 GB
   - Intel core i7 10th gen
   - Nvidia Geforce MX250

   This system was enough for single optical sensor and a single thread program but in real time scenario, we will require multiple optical sensor that will execute a multi thread program since we will be working with multiple cameras.A main frame like system would be ideal to handle the same.

2. **Optical Sensor:**
   Basic camera trap features:

- Still resolution: 30MP
- Video resolution: 4K
- Video length: Up to 180 seconds Data storage:
- SD or SDHC up to 32GB
- LCD: Yes
- Power: AA batteries
- Wireless: Yes/No

## 3.2 SOFTWARE SPECIFICATIONS:

The software requirements for this animal intrusion detection system is listed below:

1. **Twilio**

Twilio is a messaging API to send and receive SMS, MMS, OTT messages globally. It uses intelligent sending features to ensure messages reliably reach end users wherever they are.

2. **MATTERPORT:**

This is an implementation of Mask R-CNN on Python 3, Keras, and TensorFlow. The model generates bounding boxes and segmentation masks for each instance of an object in the image.

3. **TKINTER:**

The user interface for this project is done using the tkinter. Tkinter is a graphical user interface (GUI) module for Python. We can make desktop apps with Python. We can make windows, buttons, show text and images amongst other things.Tk and Tkinter apps can run on most Unix platforms**.**

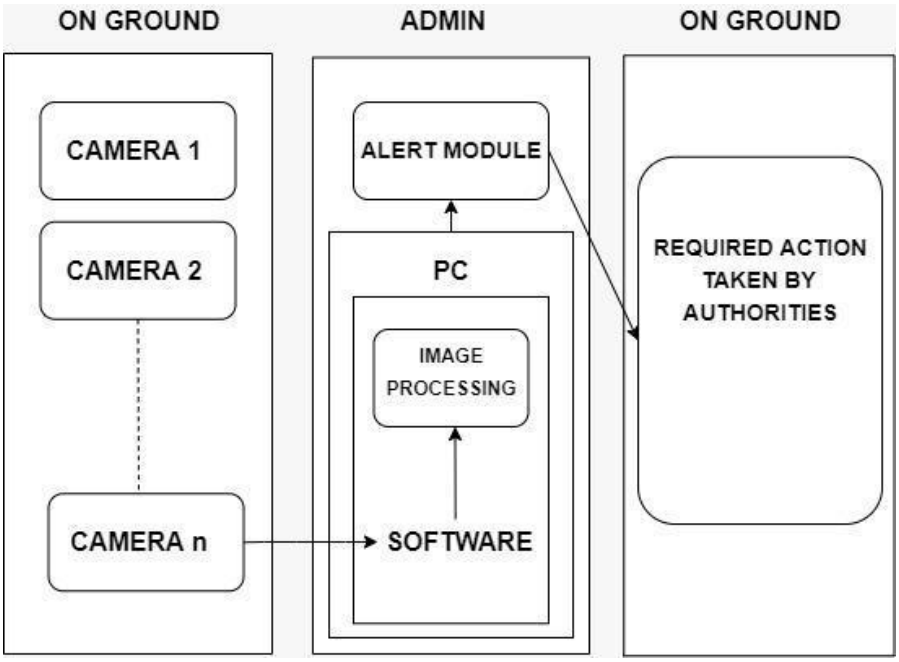
4. **PYTHON:**

Python is a general-purpose interpreted, interactive, object-oriented, and high-level programming language

# 4. SYSTEM DESIGN

Our solution to the problem statement which we have chosen is to build an animal intrusion detection system that alerts the user of sightings of animals in real time if it has entered the village or locality.

In this project, we have used the machine learning model which is trained using the Mask RCNN algorithm. Then the video is captured frame by frame. If the animal is detected in the video , we will be receiving a warning message via call, which is implemented with the help of Twilio. Basically it is a communication API which is used to send SMS, Voice and Video alerts. This is the basic working methodology behind this intrusion detection system.



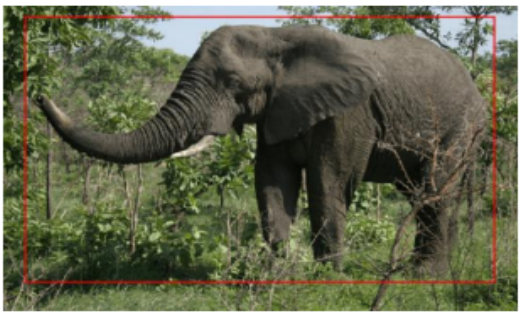

Initially we have collected the dataset from the Kaggle and we have trained using the pre-trained COCO-Model, and we have got good accuracy

**DATA COLLECTION:**

To facilitate the large number of training images needed, a combination of static images were used. Video captured directly using a webcam, then it is processed frame by frame.

**LABELING BOUNDING BOXES:**

Annotation was done using a heavily modified version of an open-source image annotation tool called make sense. This tool takes a sequence of images as input and allows the users to annotate bounding boxes with class labels over them.



## 5. IMPLEMENTATION OF THE SYSTEM MODEL:

In the proposed system the implementation can be understood in three different modules or stages. They are as discussed below:

**1.CAPTURE MODULE:**

- On clicking on the start button in the front end interface, all the CCTVs linked to the software will get activated. They will simultaneously be continuously capturing scenes from the environment that they are placed in which may or may not capture any elephant approaching the boundaries, assuming the cameras are placed in the boundary perimeter of the forest region.

**2.DETECTION MODULE:**

- The matterport (Mask RCNN) model loaded with pretrained ms coco weights successfully recognizes the elephants that are captured in the frame that is capable of recognizing 80 classes and elephant is one of them.
- .Opencv is used for capturing frames or images of environment through an optical system
- The captured frames are then checked for elephant using the model's built in function "detect"
- The detect function provides us with bounding boxes, masks, class id and other information from the image. The result is checked for the class labels found in the frame, if it contains elephant the image is masked and given as output
- On detection of the elephant by the application the alert module will be triggered.

**3.ALERT MODULE:**

- Once the elephant is detected the twilio api is called to initiate a call to the respective authority, the call plays a recorded message which was passed to the api function in the form of a cloud hosted xml file. THe program also throws an alert box on the screen to notify the front user.

# 6.RESULTS AND DISCUSSION:

From a technical point of view the results obtained are the alert messages and the calls and the captured images getting stored in the logs(in the local device) on detecting an elephant.The Application will continue to run until its stopped manually (by clicking on the quit button) or forced quit.The frames are captured with a lag of maximum of 5 secs. In comparison to the studied research papers and published works we have proposed to eliminate the two dependent sensors that are not continually functioning and are triggered by the movement of the animal or by any other form of gesture. Since we propose only a single detection mechanism that will be functioning continually without the trigger we would like to primarily focus on the accuracy aspect.The results we would like to notice on a larger scale in improvements made to get better results and actually make a difference socially.

# 7. CONCLUSION AND FUTURE WORK

The proposed solution for the Animal intrusion detection system presents a cost-effective, reliable and technically simple solution. This approach believes that by eliminating sensors that add no value to the system and by keeping the optical sensor active all the time the environmental balance can be achieved by saving the wild animals from getting harmed. The proposed method is also easy to implement and environment friendly. It can save human life and property. In the future we aim to expand this project by adding more training classes that will help increase the accuracy. We are also looking to use the captured masked images of elephants detected from the live feed which we are now storing in the logs, to train the model to get better results. We would also like dive into the math of how long it takes for the alert message and call to reach the authorities via the network and propose a camera positioning design while considering the capturing range.

# 8. REFERENCES


- Mark O. Afolabi, Idowu and A. Olalekan, “Design and Implementation of Farm Monitoring and Security System”, International Journal of Computer Applications (0975 – 8887) Volume 181 – No. 9, August 2018

- S Jeevitha and Dr. Venkatesh Kumar, “A Review of Animal Intrusion Detection System”, International Journal of Engineering Research & Technology (IJERT) Vol. 9 Issue 05, May-2020.

- Saieshwar Radhakrishnan, Ramanathan.R, “A Support Vector Machine with Gabor Features for Animal Intrusion Detection in Agriculture Fields”, 8th International Conference on Advances in Computing and Communication (ICACC-2018)

- K. Jai Santhoshi, Bhavana. S, “Intruder recognition in a farm through wireless sensor network”, International Journal of Advance Research, Ideas and Innovations in Technology et al 2018 (Volume 4, Issue 3)

- Sahane Pradnya Sambhaji, Salunke Nikita Sanjiv and Shirsath Vitthal Somnath, “Early Warning System for Detection of Harmful Animals using IOT”, International Journal of Advance Research and Innovative Ideas in Education Vol-5 Issue-3 2019

- Sheela Shivaram. K. R, Chaitra, Kshama, Sneha , Supriya, “Low Cost Alert System for Monitoring the Wildlife from Entering the Human Populated Areas Using IOT Devices” International Journal of Innovative Research in Science, Engineering and Technology Vol. 5, Special Issue 10, May 2016

- https://www.python.org/

- https://www.twilio.com/

- https://www.twilio.com/docs/libraries/python

- https://github.com/cocodataset


# 9.APPENDIX

**MAIN PROGRAM:**
**main.py (UI)**

```
from tkinter import *
from PIL import ImageTk,Image
import cv2
from visualizeCv2 import model, display_instances, class_names
import sys

ws = Tk()
ws.option_add('*Font', '19')
ws.title('Menu')
ws.geometry('650x400')
title = Label(ws, text = "Animal intrusion detection system").place(x = 30,y = 20)


canvas = Canvas(
        ws,
        width = 500,
        height = 500
        )
canvas.place(x = 30, y = 80)
img = ImageTk.PhotoImage(Image.open('./elephant0.png'))
canvas.create_image(
        10,
        10,
        anchor=NW,
        image=img
        )
```

```
canvas.place()
def start():
    args = sys.argv
    if(len(args) <2):
        print("run command: python video_demo.py 0 or video file name")
        sys.exit(0)
    name = args[1]
    if(len(args[1]) == 1):
        name = int(args[1])
        name = int (args[1])
    stream = cv2.VideoCapture(name)
    while True:
        ret, frame = stream.read()
        if not ret:
            print("unable to fetch frame")
            break
        results = model.detect([frame], verbose=1)

        r= results[0]
        masked_image = display_instances(frame, r['rois'], r['masks'], r['class_ids'],
class_names, r['scores'])
        cv2.imshow("masked_image",masked_image)
        if(cv2.waitKey(1) & 0xFF == ord('q')):
            break
    stream.release()
    cv.destroyWiindow("masked_image")

def stop():
    system.exit(0)

b1 = Button(ws, text = "Start",background="lightblue",activeforeground =
"white",activebackground = "blue",pady=5,padx=20,
command=start).place(x=500,y=100)
b2 = Button(ws, text = "Logs",background="lightblue",activeforeground =
"white",activebackground = "blue",pady=5,padx=20).place(x=500,y=200)
b3 = Button(ws, text = "Quit",background="lightblue",activeforeground =
"white",activebackground = "blue",pady=5,padx=20,
command=stop).place(x=500,y=300)
ws.mainloop()
```

**MODEL AND VISUALIZATION:**

**visualizecv2.py**

```
import cv2
import numpy as np
import os
import sys
from twilio.rest import TwilioRestClient as Call
from mrcnn import utils
from mrcnn import model as modellib
from tkinter import *
from tkinter import messagebox
import playsound
import easygui
from datetime import datetime
import string
import random
from alert import call


ROOT_DIR = os.path.abspath("../")
MODEL_DIR = os.path.join(ROOT_DIR, "logs")
sys.path.append(os.path.join(ROOT_DIR, "samples/coco/"))
import coco
COCO_MODEL_PATH = os.path.join(ROOT_DIR, "mask_rcnn_coco.h5")
if not os.path.exists(COCO_MODEL_PATH):
    utils.download_trained_weights(COCO_MODEL_PATH)

class InferenceConfig(coco.CocoConfig):
    GPU_COUNT = 1
    IMAGES_PER_GPU = 1


config = InferenceConfig()
config.display()

model = modellib.MaskRCNN(
    mode="inference", model_dir=MODEL_DIR, config=config
)
model.load_weights(COCO_MODEL_PATH, by_name=True)
class_names = [
    'BG', 'person', 'bicycle', 'car', 'motorcycle', 'airplane',
    'bus', 'train', 'truck', 'boat', 'traffic light',
    'fire hydrant', 'stop sign', 'parking meter', 'bench', 'bird',
    'cat', 'dog', 'horse', 'sheep', 'cow', 'elephant', 'bear',
    'zebra', 'giraffe', 'backpack', 'umbrella', 'handbag', 'tie',
```

```
    'suitcase', 'frisbee', 'skis', 'snowboard', 'sports ball',
    'kite', 'baseball bat', 'baseball glove', 'skateboard',
    'surfboard', 'tennis racket', 'bottle', 'wine glass', 'cup',
    'fork', 'knife', 'spoon', 'bowl', 'banana', 'apple',
    'sandwich', 'orange', 'broccoli', 'carrot', 'hot dog', 'pizza',
    'donut', 'cake', 'chair', 'couch', 'potted plant', 'bed',
    'dining table', 'toilet', 'tv', 'laptop', 'mouse', 'remote',
    'keyboard', 'cell phone', 'microwave', 'oven', 'toaster',
    'sink', 'refrigerator', 'book', 'clock', 'vase', 'scissors',
    'teddy bear', 'hair drier', 'toothbrush'
]


def random_colors(N):
    np.random.seed(1)
    colors = [tuple(255 * np.random.rand(3)) for _ in range(N)]
    return colors


colors = random_colors(len(class_names))
class_dict = {
    name: color for name, color in zip(class_names, colors)
}


def apply_mask(image, mask, color, alpha=0.5):
    for n, c in enumerate(color):
        image[:, :, n] = np.where(
            mask == 1,
            image[:, :, n] * (1 - alpha) + alpha * c,
            image[:, :, n]
        )
    return image


def display_instances(image, boxes, masks, ids, names, scores):
    n_instances = boxes.shape[0]

    if not n_instances:
        print('NO INSTANCES TO DISPLAY')
    else:
        assert boxes.shape[0] == masks.shape[-1] == ids.shape[0]
    elephant = 0
    for i in range(n_instances):
        if not np.any(boxes[i]):
```

```
            continue
        y1, x1, y2, x2 = boxes[i]
        label = names[ids[i]]
        if(label != "elephant"):
            continue
        elephant = 1
        color = class_dict[label]
        score = scores[i] if scores is not None else None
        caption = '{} {:.2f}'.format(label, score) if score else label
        mask = masks[:, :, i]

        image = apply_mask(image, mask, color)
        image = cv2.rectangle(image, (x1, y1), (x2, y2), color, 2)
        image = cv2.putText(
            image, caption, (x1, y1), cv2.FONT_HERSHEY_COMPLEX, 0.7, color, 2
        )
    if(elephant == 1):
        N = 4
        res = ''.join(random.choices(string.ascii_uppercase +string.digits, k = N))
        now = datetime.now()
        date_time = now.strftime("%m/%d/%Y, %H:%M:%S")
        color = class_dict[label]
        img = cv2.putText(
            image, date_time, (x1, y1), cv2.FONT_HERSHEY_COMPLEX, 0.7, color, 2
        )
        cv2.imwrite('./logs/frame'+res+'.jpg', image)
        call()
        easygui.msgbox("ELephants found at the border!!!", title="Alert")

    return image
```

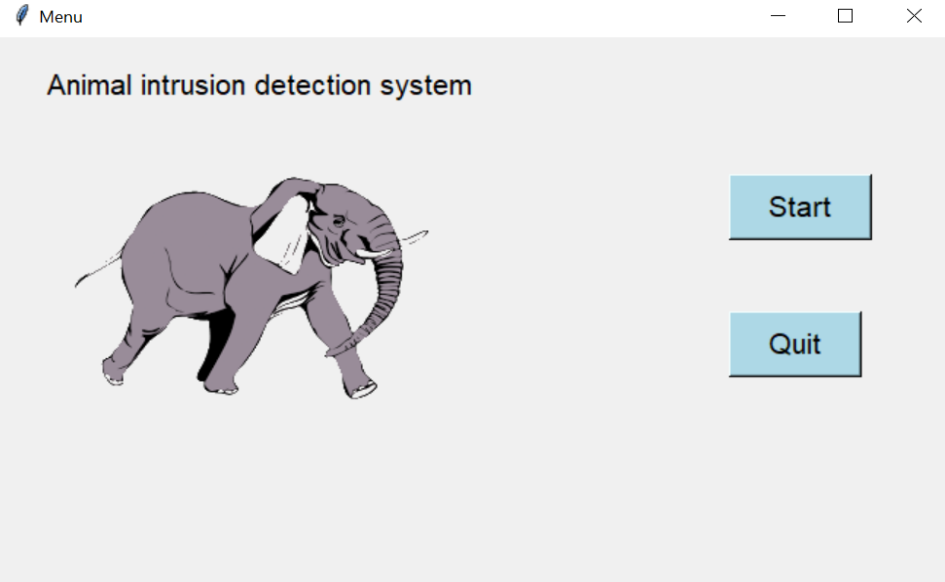
**ALERT**

**alert.py**

```
from twilio.rest import TwilioRestClient as Call
From_Number = "+17622165440"
To_Number = "+916385663044"
Src_Path = "https://tarp1.000webhostapp.com/voice.xml"
def call():
    client =
Call("AC8c95dafec60efa2f48f101edc18fcd8b","290872cc5b75629a1700c53bb646154c")
    print('Call initiated')
    client.calls.create(to=To_Number, from_=From_Number, url=Src_Path, method =
'Get')
    print('Call has been triggered successfully')
```

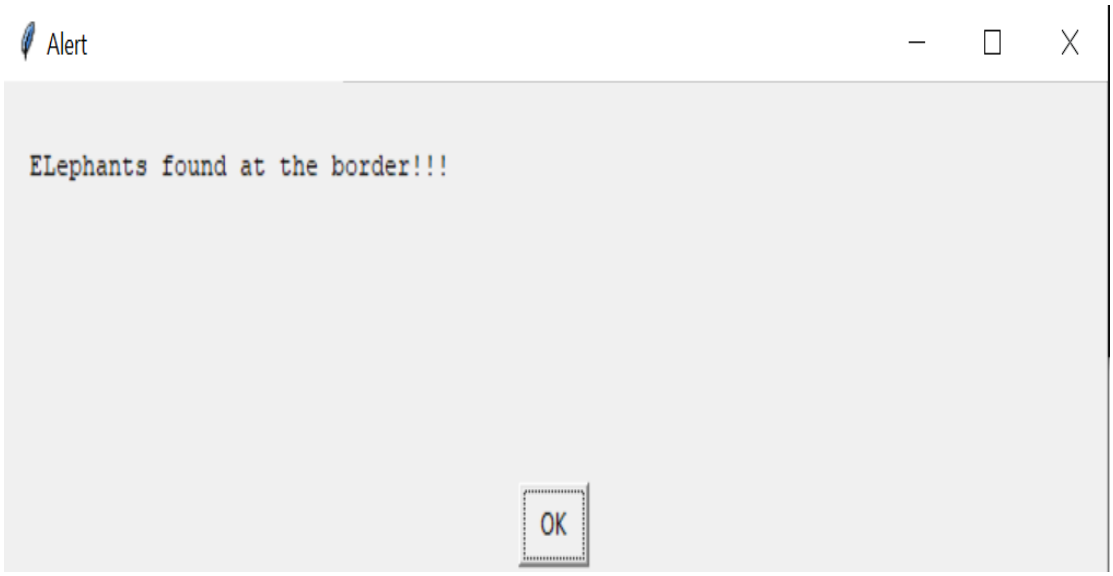
# SCREENSHOTS:

## USER INTERFACE OF THE SYSTEM:

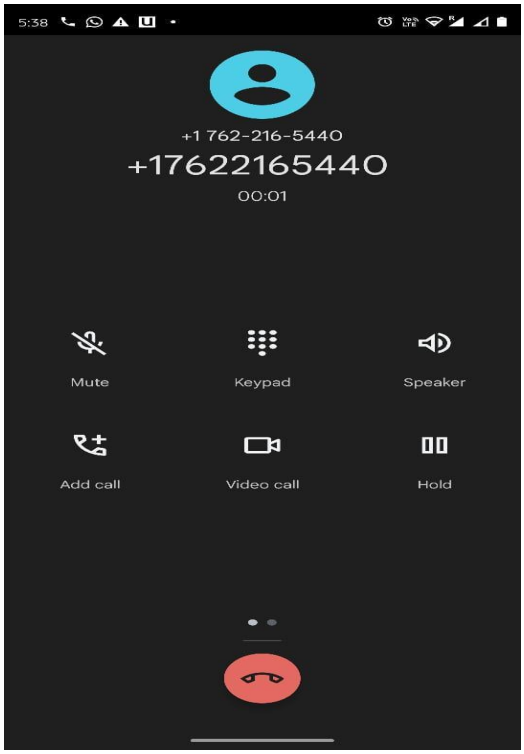



## ELEPHANT DETECTION:

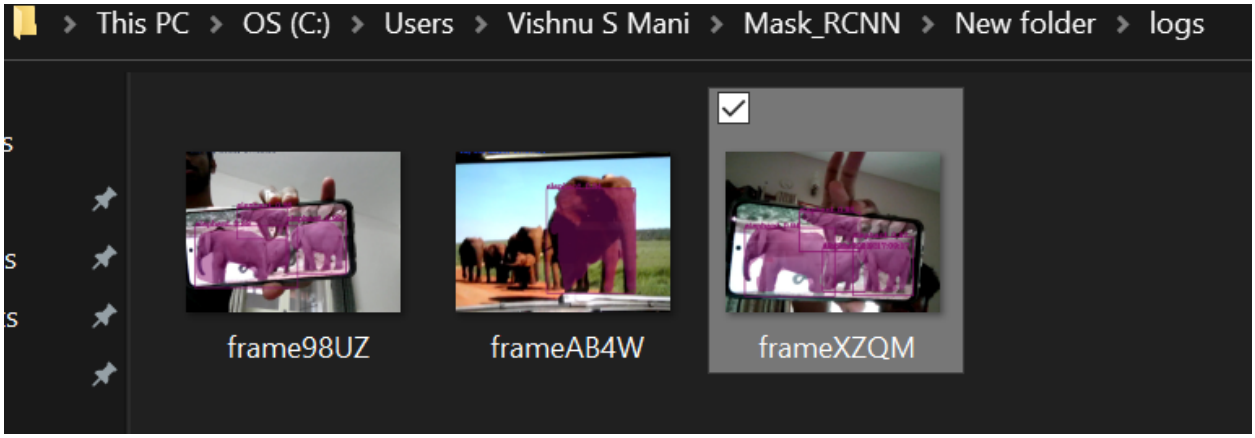
**ALERT MESSAGE- SIMPLE GUI:**




**PHONE CALL FROM TWILIO:**



**LOGS:**


This PC
OS (C:)
Users
Vishnu S Mani
Mask_RCNN
New folder
logs
frame98UZ
frameAB4W
frameXZQM