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Project

on

Intelligent Alert System For Forest Tribal People

Category: Deep Learning

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1.Introduction

1.1 Overview

All the tribal populations of India were traditionally closely associated with forests, and there are some who even today spend the greater part of their lives in the proximity of trees and villages or clans near to forest. If any dangerous predators when entered into a village or clan may lead to loss of resources or in extreme cases leads to loss of life. Here we come up with an artificial intelligence based technique which detects the animals before they enter villages. If any wild animals entered or detected this system identifies the animals and alerts the people. This ensures complete safety of humans who live near the forests.

1.2 Purpose

Today more than ever there is a great need to protect the tribals from wildlife and vice versa. Due to modernization,the forests are being cutdown which leads to serious threat to wild life.So much so many a times we come across wild animals entering into the human habitats causing serious injuries even to the extent of taking life of the people.In order to save them from this dangerous situations of attack of wild animals this mechanism of alerting them to be cautious about the approach of the wild beasts in their proximity .

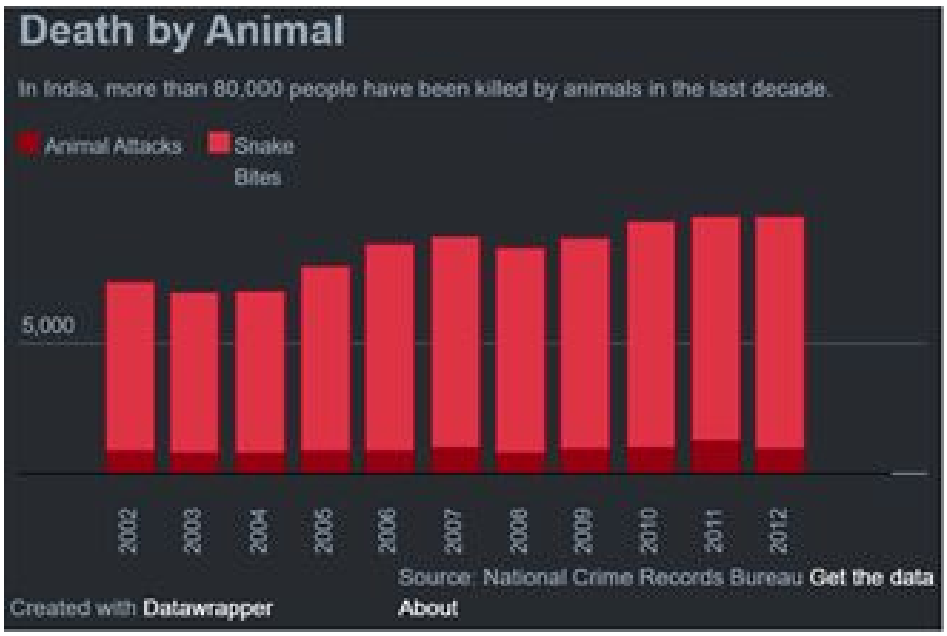
2. Literature Survey

2.1 Existing Problem

A deadly conflict is under way between India's growing population and its wildlife confined to ever-shrinking forests and grasslands. Data shows that about one person has been killed on average every day for the past three years by roaming tigers or rampaging elephants.India's animals are fighting back. Across the country, attacks by cobras, elephants, tigers and other wild beasts kill an average of more than one person every hour as India's billion-plus humans increasingly collide with nature.

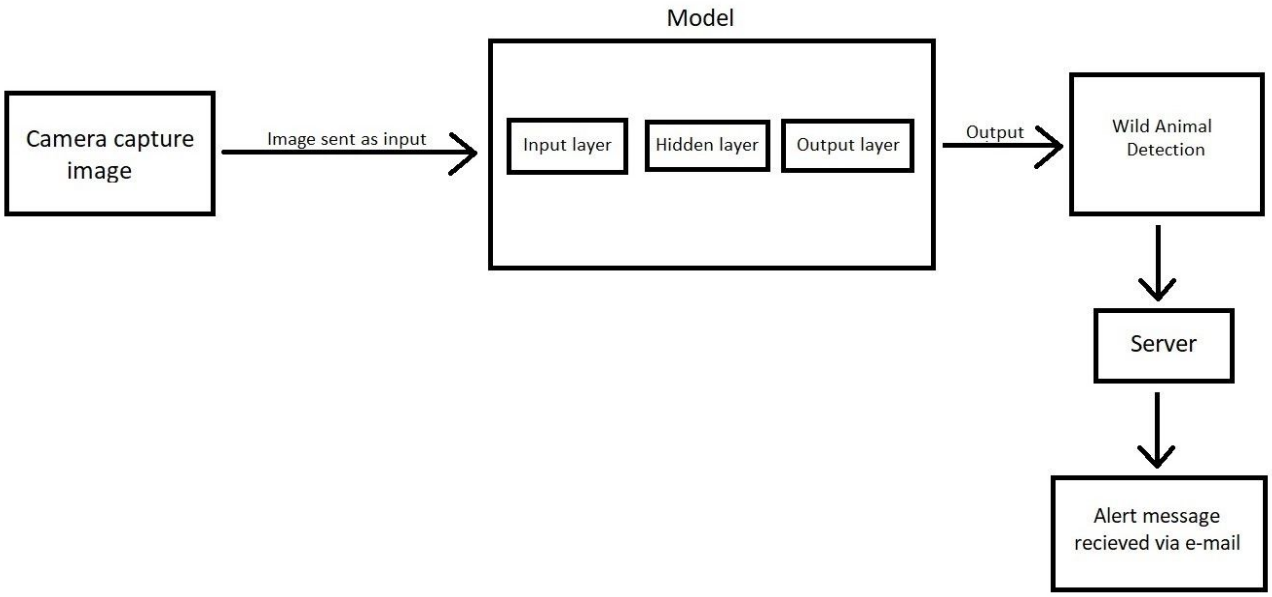
2.2 Proposed Solution

The proposed Intelligent alert system for forest tribal people model is based on neural networks(CNN) incorporated with an alerting system. This system will monitor the entire villages of surrounding forests at regular intervals through a camera.Once any dangerous animal is detected then it will send information to the people in the village and it will produce an appropriate sound or alarm in the village to alert the people.



3. Theoretical Analysis

3.1 Block Diagram



3.2 Hardware/Software Designing

Software:

- Python
- Python Web Frameworks
- CNN

Hardware:

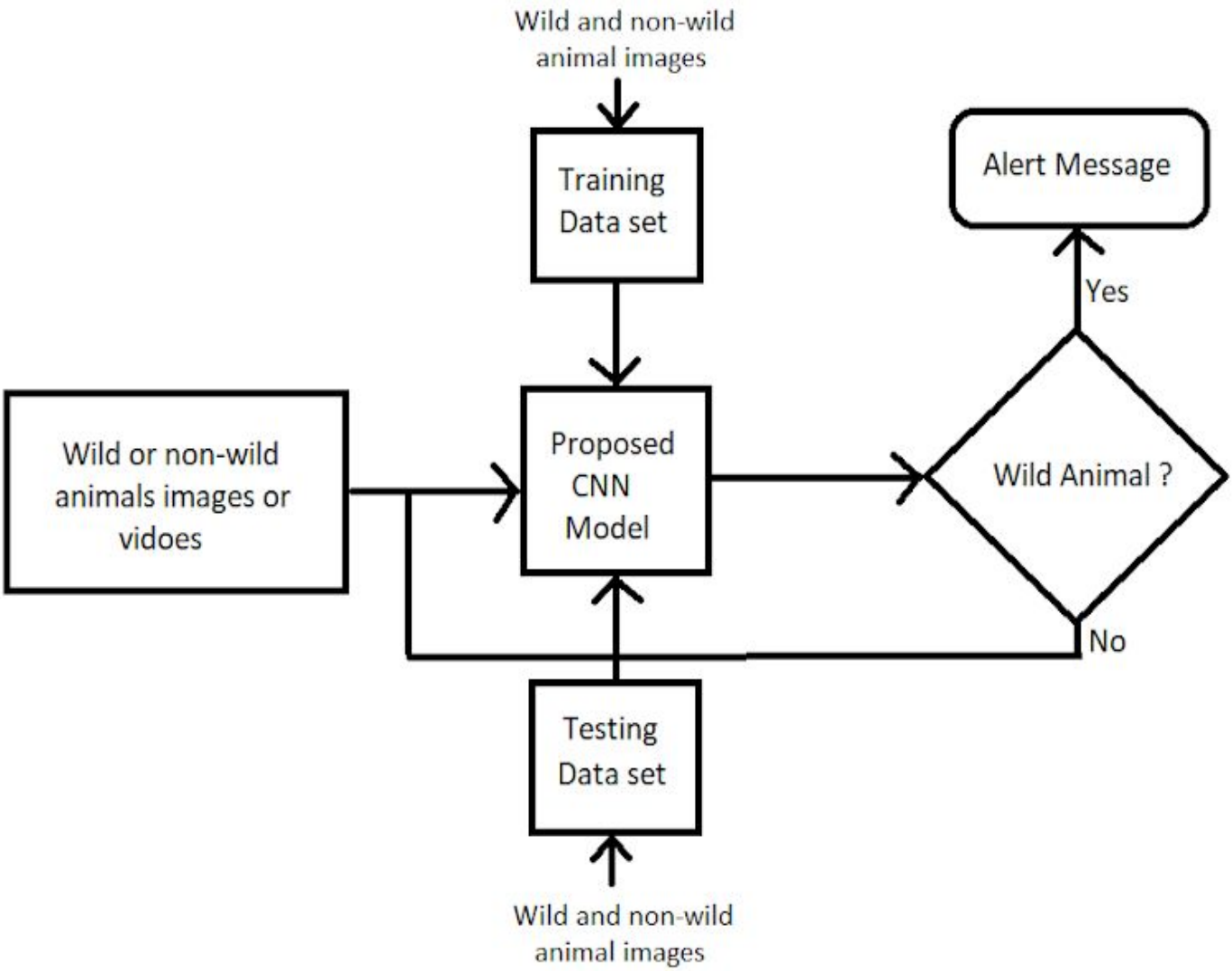
- Laptop

4. Experimental Analysis

Deforestation is one of the most pressing environmental issues that the world is facing currently. It is the conversion of forested land to non-forested land by humans. Deforestation occurs when a land dominated by naturally occurring trees is converted to provide certain services in response to the human demand.Senseless mining in hills and forests has resulted in wild animals entering human habitations in search of food and water. The drying up of water sources in the summer is also to be blamed for it. Due to squeezing of forest area, wild animals are losing their habitat. The animals are facing food and water scarcity due to massive deforestation. Hence many times wild animals come out of forest areas and enter human habitats in search of food and water. Though this isn't entirely their fault tribal people and those who live near the forests suffer the most since the most vulnerable to these attacks and our model aims to help those people.

Convolutional Neural Networks (CNN) are everywhere. It is arguably the most popular deep learning architecture. The recent surge of interest in deep learning is due to the immense popularity and effectiveness of convnets.CNN is now the go-to model on every image related problem. In terms of accuracy they blow competition out of the water. It is also successfully applied to recommender systems, natural language processing and more. The main advantage of CNN compared to its predecessors is that it automatically detects the important features without any human supervision.CNN is also computationally efficient. It uses special convolution and pooling operations and performs parameter sharing. This enables CNN models to run on any device, making them universally attractive. Using CNN our model accurately determines and alerts the villagers about the presence of a dangerous animal giving them ample time to prepare and save their lives.

5. Flowchart


Wild and non-wild animal images
Training Data set
Alert Message
Yes
Wild or non-wild animals images or vidoes
Proposed CNN Model
Wild Animal ?
No
Testing Data set
Wild and non-wild animal images

6. Result

Training and validation of CNNs for predicting and detecting wild animals.The results show that the proposed algorithm achieves good detection rates. These results indicate that the proposed method is accurate.To measure the performance of the proposed model, we have tested our model by providing various wild and non-wild animal images collected from Internet .We provided 350 each images of wild and non-wild animals to train the model. It predicts whether it is a wild animal or not moreover a message is sent to people around to be cautious about the wild animal.These results indicate the good performance of the proposed method in wild animal detection as well as prediction.

7.Advantages and Disadvantages

Advantages:

- **Allows independent data verification**
- **Landscape scale**
- **Low cost**
- **Low survey effort**
- **Range analyses**
- **Tribes or villagers will be informed in advance so that they can take safety measures.**
- **Tribes and villagers will also get to know which wild animal is near their surroundings.**

Disadvantages:

- **Disturbance effects**
- **Limited sample size**
- **All the villagers might not have the facility to receive a message via device.**
- **Requires ground-truthing to avoid inferential**
- **Stationary**
- **Technological failure**

8.Applications

The great advantage of camera traps is that they can record very accurate data without disturbing the photographed animal.

They minimally disturb wildlife.They operate continually and silently and provide proof of animals present in an area.

This technique is a cost-effective monitoring too0l.Infrared flash cameras have low disturbance and visibility.

The major alternative light source is infrared, which is usually not detectable by mammals or birds.

Camera traps are helpful in determining behavioral and activity patterns of animals, such as which time of day they visit mineral licks.

Camera traps are also useful to record animal migrations.

Tribes and villagers can know the dangerous animals near their area and can take precautionary measures in advance.

They can also report the geographical organisations about the animals so that animals can be moved to sanctuaries.

9.Conclusion

Convolution neural networks approach is used to predict and detect wild animals.The proposed neural network is a multilayer perceptron whose number and size of hidden layers can be heuristically determined for each application using its available data examples. The learning algorithm used to train this neural network is the backpropagation algorithm ensures the convergence to a local minimum of the global error observed at the output layer of the network.In this study, we conducted to detect wild animals through providing pictures.However, we tried to make it possible to apply more accurate by combining the deep learning technology. We collected image data sets of wild animals and non-wild animals and trained them with our CNN model and used OpenCV for processing videos to detect wild animals.

10.Future Scope

In future we can reduce the risk of life loss and damage caused by the sudden outbreaks of wild animals into villages. For future work the system can be improved by having an automatic alarm to alert the villagers beforehand and also predict the animal inorder to take safety measures accordingly.

11.Bibliography

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To create train and test sets:
https://thesmartbridge.com/documents/spsaimldocs/CNNcollection.pdf

Data Preprocessing:

https://thesmartbridge.com/documents/spsaimldocs/CNNprep.pdf

Model Building:

https://thesmartbridge.com/documents/spsaimldocs/CNNflow.pdf

OpenCV for video processing:

https://opencv-python-tutroals.readthedocs.io/en/latest/py_tutorials/py_gui/py_video_display/py_video_display.html

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