



**VIT<sup>®</sup>**  
**Vellore Institute of Technology**  
(Deemed to be University under section 3 of UGC Act, 1956)

## **FEASIBILITY STUDY**

### **ANIMAL INTRUSION DETECTION SYSTEM**

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## **Table of Contents**

### **1. Problem Statement**

### **2. Feasibility Study**

- 1. Legal Feasibility**
- 2. Technical Feasibility**
- 3. Economic Feasibility**
- 4. Operational Feasibility**
- 5. Scheduling Feasibility**

## **PROBLEM STATEMENT:**

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

## **FEASIBILITY STUDY:**

A feasibility study is an analysis that takes all of a project's important factors into account—including economic, technical, legal, and scheduling problems—to ascertain the likelihood of completing the project successfully. Project directors use feasibility studies to distinguish the pros and cons of undertaking a project before they invest a lot of time and money into it.

### **1. LEGAL FEASIBILITY**

Intrusion Detection Systems helps information systems prepare for, and deal with attacks. Its implementation can make lives easier but if not implemented the right way it can give a pretty bad result. So listing out the risks and taking measures against them is the best way to bring down the probability of it happening.

#### **1.1. Prevention**

Technical knowledge of identifying the wild animal and animal part. To monitor Communities involved in wildlife crime. Their cultural habits and association with the crime mafia. Planning of foot patrolling and effectiveness in monitoring the wildlife.

## **1.2 Experimentation**

The animals that are least capable of feeling emotions majorly pain should be used for animal experimentation. Wherever there was an alternative present and still, the experiment was conducted on an animal, then proper reasoning needs to be given as to what led to the decision of using the animals for experimentation.

## **1.3 Living Conditions**

The animals should be suitable for their species. For biomedical purposes, the animals must be handled by a trained scientist or veterinarian.

## **1.4 Climate change**

Human-wildlife conflict has also increased due to invasive species and the lack of sufficient food for wildlife inside the forest boundaries. One of the probable reasons for the random movement of wild animals into the fringes of villages and towns in recent years could be climate change.

## **1.5 Safety**

There are hardly any forests left in India where the big cats and other wildlife can live peacefully. Local people and hunters kill and eat up herbivores like a hare, deer, etc and carnivores go hungry or starve or are killed by poachers or locals. The safety of both wildlife and humans is still a conflict.

## **2. ECONOMIC FEASIBILITY**

One of the largest hurdles and misconceptions of any new technology is the question of whether the model can prove to be economically feasible. The following analysis explains the financial feasibility of the animal intrusion detection system.

### **2.1. Hardware Costs**

The components needed for the project are not sophisticated and do not need any custom design, so the components are readily available in the market or already installed in society even before the implementation of the project . Since there are public CCTVs that are available everywhere the amount spent for the new installments are reduced. There needs to be a central system that works on the feed preferably a mainframe since it needs to work on multiple feeds simultaneously which again is available in the market for reasonable prices.

### **2.2. Software Costs**

The software cost for building all the modules will be minimal since the project does not need any paid third-party libraries or tools. The tools are completely open-source and supported by the community. So the only cost applicable is the development cost.

### **2.3. Maintenance Costs**

Since the project does not use any machinery or moving parts, there won't be a necessity for frequent maintenance. The maintenance we will have to deal with replacement or repair of any hardware that has problems, the probability of which is quite low.

## **3. TECHNICAL FEASIBILITY**

The system largely relies on the technology to run in real-time. Before implementing such a system we need to ensure we have enough knowledge of how to run the system without frequent technical problems. By putting a half-cooked system on the field it can put the residents in danger. Thus technical analysis is extremely necessary.

### **3.1. Accessibility**

The hardware required for this project is simple and easily available. All that is necessary are any kind of optical device and a computer to process and evaluate the visuals captured.

### **3.2. Features**

Once developed the system will be able to detect and recognize animal's real-time. And if the animal is recognized the user is alerted with the essential information. This is made possible by training the

model with enough data to enable the system to recognize animals. The system's performance highly depends on the accuracy of the model, this makes the training phase a crucial one.

### **3.3. Software**

The training phase uses various tools like TensorFlow and Cuda. And algorithms like faster-rcnn will help us produce the desired accuracy. The product of the training phase can be integrated with interphase made with a python GUI toolkit like Tkinter. There will also be an alert module that can alert the user with audio and visuals which can be set with basic python coding.

## **4. OPERATIONAL FEASIBILITY:**

Operational feasibility is performed to understand well a proposed system solves the problems. From this aspect, operational feasibility studies are critical for system engineering and affect early design phases.

### **4.1 Modules**



In the animal intrusion detection system, we have are three modules and they are listed below object detection, object recognition, and the alert module

## **4.2 Alert**

This kind of real-time alert can avoid animal accidents and also can help the residents to do the needful. The alert module will detect the movement of the animal and the camera will capture the image, using image processing techniques. The alert can be conveyed in the form of sound or a message.

## **5. SCHEDULING FEASIBILITY:**

A schedule feasibility study is a process of evaluating the degree to which the possible period and completion dates for all major activities within a project meet organizational deadlines and restrictions for affecting change. This assessment is the most important for project success. A project will fail if not completed on time. In scheduling feasibility, an organization estimates how much time the project will take to complete. The team or company which develops the intrusion detection system should complete the entire project as per the requirements and needs of the stakeholders which solve their problem statement with the appropriate features before the deadline the company should submit the entire project with the estimated budget.

