# Forest Animal Detection System Using Machine Learning

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## ABSTRACT

In forest areas and agricultural areas human andanimal conflictis abigproblem wherethere isanumberofresources is lost. Due to this People lose their products, income,andsometimestheirfood.So,thisistobemonitoredcontinuouslyto prevent entry of animals. With keen onthis problem, we havemade a model to develop the system which will monitor the fieldwithoutanyharms.Atfirstitwilldetectintrusionaroundthefieldusing sensor, then camera will capture the image of the intruderand classifying them using image processing and then Takingsuitable action based on the type of the intruder. Finally sendsnotificationtoparticularpersonandforestofficialsusingTelegram application. In India, nearly 65% of the people aredirectlyorindirectlydependentonagriculturalsectorforeconomic survival. The annual income of farmers is significantlyinfluencedbytheyieldofthecrops,whichiscontinuouslydecreasing due to natural phenomena and poor technologicaladvancement.Manyoftheusedmethodsresultinextinctionoftherare species. Therefore, there is a need to develop alternativetechniques,suchthatitdoesnotharmbirdsandanimalsphysically as well as protects the crops, thus we have collectedsources from the experts in the fields of ornithology, agriculturalsectors and field visits, to avoid irreversible harm to the Indianbiodiversity.Thisresearchanalyzesthelossofyieldofcropduetobirds and animals, explores repelling techniques adopted by thefarmers,andaddressestheconsequencesofdamagecausedbythebird and animals to field crops in India. This project protectionfrom birds and animals to reduce the loss of crops and thus helpsfarmerstoreducetheriskof crop damage.

**Keywords:** Forest Zone, Agriculture field, Animal Detection,ImageProcessing, Live capture,AlertthroughTelegram

## I. INTRODUCTION

Indiaisanagriculturalcountry.AgriculturehasalwaysbeenTheIndia'smostimportanteconomicalsector.Thoughmostof theIndia'spopulationdependsonagriculture,therearelotsandlotsofproblemshasbeenbeingfacedbyfarmers.Humanani malinterruptionisabigproblem where large number of resources is lost and ourfarm is in danger. In recent times these kind of problem isincreasing rapidly. So, the area is to be protected safely toprevententryofanykindofanimalsandatthesametimeitshouldnotbeanyharmtoanyone.Human and animal interruptions arises due to forestdisasters,humansshiftingintotheforesttosatisfytheirlivelihood,forclaimingofland foragriculturalpurposesandindustrializationcausesspreadingofurbangroundandanimals enter the nearby villages to satisfy their needs whichhasbeendemolished.Elephantsorwildboartrampthecultivation in farm land in need of food. Need of the animalorhumanputtheotherinrealdanger,inthisprocess,resources are wasted and sometimes we can't guarantee ourlife too. Human and elephant conflict is more in south Asiaand in Africa. Usually, farms are protected with electricalfence;animalwhichtriestoenterthefieldsufferselectrocution with intense pain cause animals to behave inabnormalmanner.

## II. EASEOF USE

### A. RelatedWork

Wildlife monitoring is crucial for tracking animalhabitatutilization,populationdemographics,poachingincidents, and movement patterns. Numerous technologieshave been introduced that includes motion-sensitive cameratraps, radio tracking, wireless sensor network tracking, andsatellite for monitoring wild animals. Currently, the animalespialandrecognitionarestillanarduouschallengeandthereis no unique method that provides a sturdy and

efficientsolution at all situations. Monitoring wild animals throughcameratrapsareprominentduetotheircommercialavailability, equipped features, and ease deployment. TheExtractionofknowledgefromthesecameracapturingimagesis implemented using machine learning and deep learningmodels. Machine learning (ML) plays a key role in a widerangeofstatistical,imagerecognition,naturallanguageprocessing,andexpertsystems.

### B. Proposedsystem

Inthisweareusingdeepconvolutionalneuralnetworkmethodtodetecttheanimalsandbirdsinlivecapture.Inthefirstprocess ofdetectioninlivecaptureanimalandbirdis, we are used to pre–train the structure of the animals indifferent angles, for every animals we need to pre-train theimagesofthedifferentangle.

Inourproject,theliveimagesarecapturedandmatched with pre-trained images and gives sound throughspeaker and to repelled the animals in night time the flashlightsareused,Whenthealertaregivenassoundthemessageissenttofarmerviatelegram.

### III. IMPLEMENTATION

WeusedPython3.7PlatformandAnacondaTool(Spyder).ThefirststepistoinstallAnacondaTool.

### A. Stepbystepprocess:

- Firstdetecttheinterruptionaroundthefield.
- Tocapturetheimagehowtheinterruptionhappensand
- Categorizethemusingimageprocessing.
- Takingfittingmeasuresbasedonthetypeoftheinterruption.
- Tosendnotificationtofarmownerand
- ForestofficialsusingTelegram.

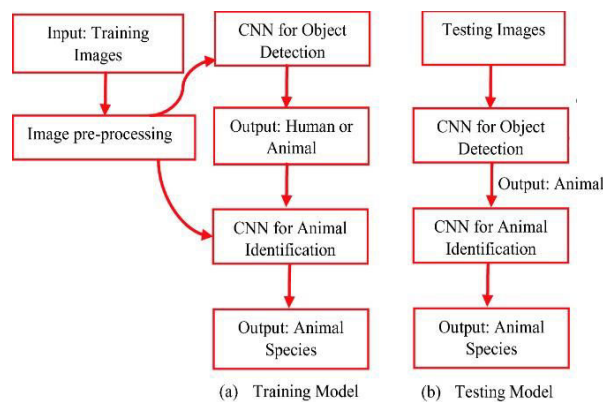### B. Architecture



(a) Training Model  (b) Testing Model

Fig1:Architectureofthesystem

### C. Results

ThusthisprojectusesConvolutionalNeuralNetwork (CNN) algorithm to detect wild animals. Thealgorithmclassifiesanimalsefficientlywithagoodnumber of accuracy and also the image of the detectedanimal is displayed for a better result so that it can beused for other purposes such as detecting wild animalsenteringintohumanhabitatandtopreventwildlife.

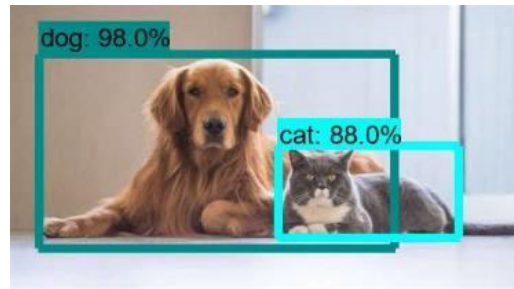Fig2:Predictingaccuracyoftheanimal



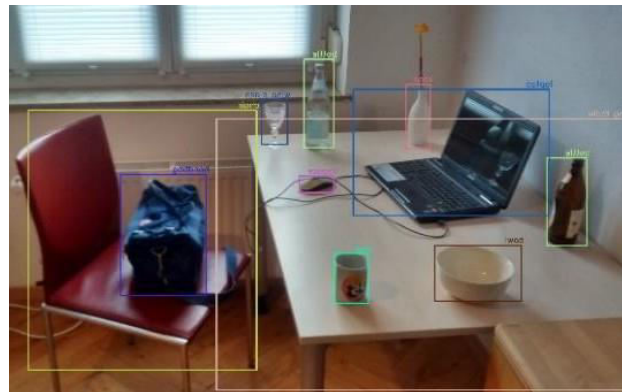Fig3:Predictingaccuracyoftheobjects

## IV.    CONCLUSION

Inthispaper,thewell-knownalgorithmsofmachinelearning    such    as    SVM,    Random    Forest    and    deep learningmodelsincludingAlexnet,inceptionV3 arecomparedforclassificationofwildanimalspeciesfromKTHdataset.AmongwhichdeeplearningmodelinceptionV3o utperformsthanothermodelsandachievesbetteraccuracy.Theexperiment    uses    KTH    dataset    that    composed    of 19differentcategoriesofanimalsamongwhich12classesareselectedtomeasuretheperformanceofthemodels.Fromthee xperiment,         random         forest         produces         better         results comparedtoSVM.Among,deeplearningmodelsinceptionV3conferredexcellentresult.However,machinelearningalgo rithm provides goodaccuracy for the small dataset ratherthanthe largedataset

## V.    FUTURESCOPE

Thesystemcanbefurtherextendedbysendingtheimageand alert in the form of a message when the interruption isdetected to the nearby centres. Furthermore it can be used toreduce human wildlife conflict and also some accidents. Wecan produce corresponding warning alerts for animals to gooutfrom agriculturelands.

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