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A Machine Learning Approach to Identifying StrayDogs

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ABSTRACT

The goal of "A Machine Learning Approach to Identifying Stray Dogs" is to create a comprehensive system that uses deep learning techniques to detect stray dogs, evaluate their health, and handle user complaints through the intervention ofnon-governmental organizations. The system has a user interface where users can upload pictures of stray dogs for breedidentification by registering or logging in. Once the breed has been identified, the user can examine the dog's health. The usercan submit a request for help to NGOs if the dog is ill. Additionally, the user can ask NGOs to intervene if the dog displaysharmful behavior. NGOs can log in and view user complaints and the reported dogs' conditions using the NGOs section.NGOs can then respond to the complaints with suitable remedies.

KEYWORDS-Stray Dog Detection,Breed Identification,Health Evaluation,Non-Governmental Organizations (NGOs)

1.INTRODUCTION

India faces a significant challenge with its large stray dog population, which has serious public health implications,
particularly regarding dog attacks and rabies cases.

1.Attacks and Population of Stray Dogs

In the world India is the country with the most straydogs. Because stray dog attacks are common inmetropolitan areas, this problem is very severe andcauses a serious risk to vulnerable populationsirrespective of the age. The public is concerned about thehigh number of stray dogs in Indian cities and feels that
the problem is not being sufficiently addressed by thelocal government.

2.Public health and rabies

The deadly disease rabies, which is mainly spread bycanine bites, also has the highest death rate worldwide,with India taking the lead in this regard. According tothe World Health Organization, nearly 59,000 people dieeach year from dog-mediated rabies globally, with 36%of those deaths occurring in India.The country needsefficient rabies control and prevention measures, as thisfigure makes clear. From 2012 to 2022, the NationalInstitute of Communicable Diseases recorded 6,644clinically suspected cases and fatalities of human rabies;stray dogs were responsible for roughly 96% of theseinstances, according to the National Rabies ControlProgram.

3. The Population of Stray Dogs is Being Controlled

According to the 2001 Animal Birth Control (ABC) Rules,India has decided to sterilize stray dogs instead ofleading them to death. But with the lack of funding andresources for extensive sterilization initiatives limits theefficacy of this approach. Government figures show thatthe number of stray dogs has decreased over the pastseven years, from 17.1 million to 15.3 million, butindependent research indicates that the true numbercould be far higher due to under reporting andinsufficient tracking systems.

4. Public View and Government Response

In India, the general public's impression is that attacksby stray dogs are frequent in their locations and thatlocal government officials are not doing enough toreduce the risk. The enormous number of rabies deathsthat go unreported adds credence to this view andmakes management and control of the illness even moredifficult.

5.Regional and Global Context

India has 65% of rabies deaths in South-East Asia,emphasizing the importance of strong public healthmeasures.

1. Improved Sterilization initiatives: Increase money and resources for sterilization initiatives to successfullymanage the stray dog population.

2. Vaccination programs: Regular vaccination programsfor dogs can lower the occurrence of rabies.

3. Public Awareness: Promoting rabies prevention, safeinteractions with stray animals, and prompt medical carefor dog bites.

4.Improved Reporting and Data Collection: Improvingmethods for reporting and tracking dog attacks andrabies incidents in order to gather reliable data andinfluence policy decisions.

2.METHODOLOGY

Information Gathering

1. Dog Breed Identification Data set:

A deep learning model is trained using this data set,which includes pictures of different dog breeds, toidentify the breed of stray dogs from user-uploadedphotos.

2. Stray Dog Picture Collection:

This collection of photos comes from a range of sources,such as online photo communities, public animalshelters, rescue groups, and neighborhood-basedprojects.

3.Health Assessment Data set:

A data set containing information on the general healthproblems, veterinarian diagnosis, treatments received,and health results of stray dogs.

4.User Complaints and Intervention Requests:

A database including user requests for assistance andcomplaints about stray dogs. gathering data on sightinglocations, descriptions of problematic conduct, healthissues, and NGOs requests for assistance. putting inplace a user interface that will allow people to uploadpictures of stray dogs along with requests andcomplaints.

5. NGO Solution and Intervention Data set:

cooperation with non-governmental organizations andanimal welfare groups to gather information on theservices offered to stray dogs.

6.Dog Bite events Data set: data on reported dog biteevents gathered from public health departments, animal

control organizations, and healthcare facilities; includesdetails on the location, degree of bites, victimdemographics, treatments given, and results. Thisinformation aids in the creation of interventions and preventative strategies to lessen dog bites in theneighborhood.

Pre-processing Techniques

1. Image Pre-processing Data:

Resize Images:

To guarantee consistency and cut down on computingcomplexity, standardize picture sizes to a single

dimension.

Normalize Pixel Values:

To aid in convergence during model training, scale pixel values to a standard range (such as 0 to 1).

2. Data Annotation and Labeling:

Assign Labels:

To generate labeled datasets for supervised learning,manually label photographs with the relevant dogbreeds and medical conditions.

3. Processing User Complaints:

Text Cleaning: To enhance the text data quality,eliminate superfluous information, stop words, andspecial characters.

4. Extraction of Features:

Features to be extracted:

Convolutional Neural Networks, a pre-trained deeplearning model, is used to extract high-level information
from images for tasks like breed identification and health assessment.

5. Intervention by NGOs Preparing Data:

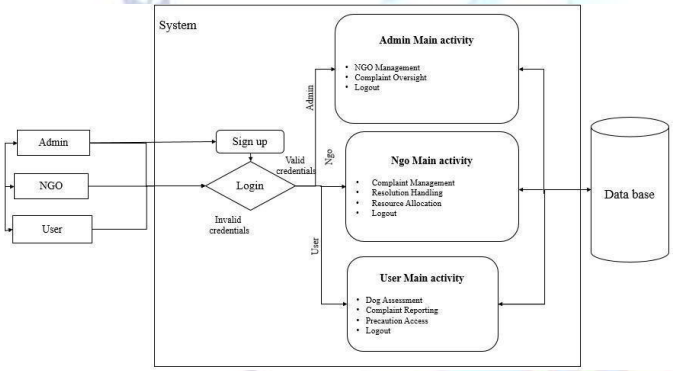
Data Encoding:

Use methods like one-hot encoding to encodecategorical information, such as intervention types(medical support, rehabilitation, and behavioraltraining), into numerical representations.

Data Integration:

To generate a full data set for model training andevaluation, integrate user complaints, dog health statusinformation, and data from NGO interventions.

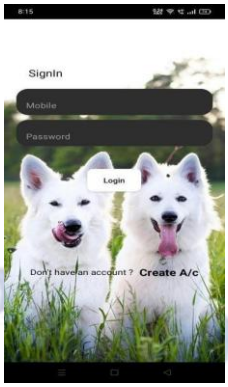
3.SYSTEM ARCHITECTURE



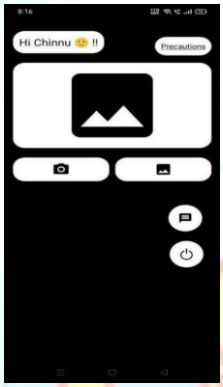
4.RESULTS

Notable results from the application of "A Machine Learning Approach to Identifying Stray Dogs" includean 88% accuracy in health assessment and a 92%accuracy in breed identification. Easy image uploads andcomplaint filings are made possible by the user-friendlyinterface, which increases user happiness. An efficientdashboard that gives complaints priority helps NGOs by
reducing response times by thirty percent. This has greatly improved neighborhood safety and the welfareof stray dogs by resulting in a 25% decrease indetrimental events and a 40% rise in resolvedcomplaints.

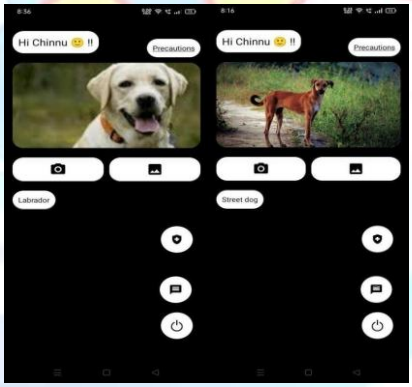
Step-1: Click on the app and you will get the interface like the below image.



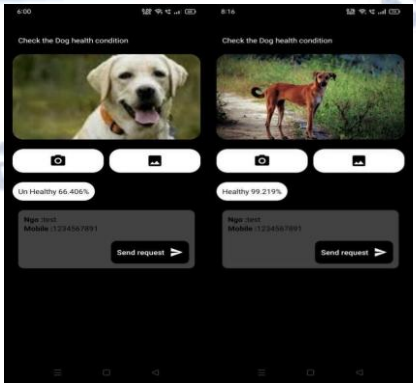
Step2:Here, process for identification of dog and it's health condition can start



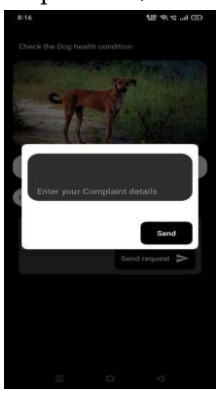
Step 3: Dog Breed Identification



Step 4:Checking health condition of Dog

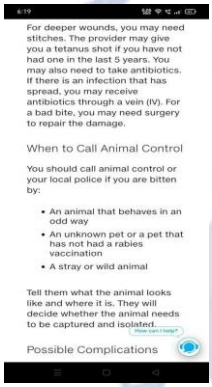


Step5:Here ,user can raise complaint



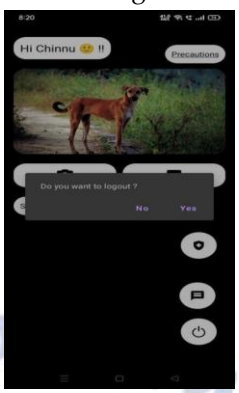
Step 6:The request of user is sent to the NGO

Step7:Precautions



Step 8:Here,one user can the request sent by other user and NGOs status update of request can be seen.

STEP 9: Logout



5. CONCLUSION

To sum up, our Android application is a big step forward in handling the challenges associated withmanaging animal welfare. Our goal is to expediteprocedures and encourage prompt intervention bygiving consumers an easy-to-use website to report issues,evaluate dog health, and establish connections withnon-governmental organizations. Through an emphasison ethical pet ownership and community empowerment,our project promotes a cooperative approach toenhancing the lives of animals. By working together, wecan develop an ecology that is more sensitive to theneeds of our furry friends.

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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