"Smart Vet Locator for Hybrid Pets".

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Abstract- *There is a trend of having Stylish pets of different breeds and types. The trend has inclined mainly towards pets of foreign breeds. Despite the trend, there is a grave problem faced by the pet owners when these pets are unwell. There are no proper resources available to the pet owners to find an appropriate vet for the sick pet.*

Keywords- **SVM (Support Vector Machine), ML(Machine Learning), Image Processing, Vet Locator, Pet Image.**

1. INTRODUCTION

We aim at creating a comprehensive ecosystem for pet owners who aim to find an appropriate vet. Since the pet owners lack the knowledge of correct breed of pets, we will make a smart system to recognize the breed of the pet form the pets image uploaded by the owner. Further, we will take the pets image and the users location as inputs. Using the inputs, we will find the nearest vets who specialize in treating the pets of a breed. The list of vets presented to the user will be optimized based on location of the user. The user will then be able to book an appointment with the vet. The system will also allow for follow up check ups. Image processing and advanced classification techniques will be used for recognizing the pet type from the image. We aim at using the Support Vector Machine algorithm for the purpose of classification. Various image processing techniques will also be used. The fields which are benefitting from the advancements in Artificial intelligence are countless. But with the advancements in the arena of Artificial Intelligence, many new fields are coming up. The commercial business of fancy pets is one of those. Pets have become a status symbol and the global market for stylish pets is increasing rapidly in terms of market capitalization every year. This increasing market, however, is not able to keep up with the increasing demands of the fancy pet owners throughout the pet's life cycle.

There is a trend of having Stylish pets of different breeds and types. The trend has inclined mainly towards pets of foreign breeds. Despite the trend, there is a grave problem faced by the pet owners when these pets are unwell. There are no proper resources available to the pet owners to find an appropriate vet for the sick pet.

1.1. Support Vector Machine algorithm

Support Vector Machine (SVM) is a supervised machine learning algorithm which can be used for both classification challenges. However, it is mostly used in classification problems. In this algorithm, plot each data item as a point in n-dimensional space (where n is number of features you have) with the value of each feature being the value of a particular coordinate. Support Vectors are simply the coordinates of individual observation. In this paper mainly we will consider the input is based upon Support Vector Machine as training data, testing data is decision value. In this method we consider the following steps like Load Dataset, after loading the dataset will Classify Features (Attributes) based on class labels then estimate Candidate Support Value, like the condition is While (instances!=null), Do condition if Support Value=Similarity between each instance in the attribute then finding the Total Error Value. Suppose if any instance < 0 then the estimated decision value = Support Value\Total Error, repeated for all points until it will be empty. Therefore mainly we have calculated the entropy and gini index.

1.2 Canny Edge Detector for Image Processing

Canny edge detection is a technique to extract useful structural information from different vision objects and dramatically reduce the amount of data to be processed. It has been widely applied in various computer_vision systems. Canny has found that the requirements for the application of edge_detection on diverse vision systems are relatively similar. Thus, an edge detection solution to address these requirements can be implemented in a wide range of situations. The general criteria for edge detection include:

Detection of edge with low error rate, which means that the detection should accurately catch as many edges shown in the image as possible

The edge point detected from the operator should accurately localize on the center of the edge.

A given edge in the image should only be marked once, and where possible, image noise should not create false edges.

1.2.1. The process of algorithm(Canny Edge Detector) development has the following steps:

- Grayscale conversion
- Gaussian blur
- Determine the intensity gradients
- Non maximum suppression
- Double thresholding
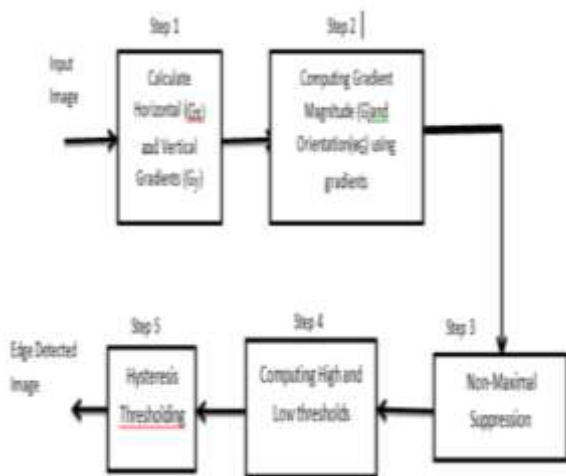- Edge tracking by hysteresis
- Cleaning up

Fig.1 Block Diagram Of Canny Edge Detector

1.2.2.Feature Extraction

There are total 8 features are extracted from the input image using Greycoprops

- Mean
- Variance
- Moment
- Contrast
- ASM
- Correlation
- Dissimilarity
- Energy

2. LITERATURE SURVEY

2.1. Identification of Relations from IndoWordNet for Indian Languages using Support Vector Machine

Inspection of the SVM classifier for identification of relations in Indian Languages apart from English SVM successfully implemented for identification of relations in Indian Languages from the IndoWorldNet this aims at implementing SVM in the field of text classification.

2.2.Sentiment Classification based on Ontology and SVM Classifier

SVM has been used for sentiment classification by making SVM act as a binary classifier to classify sentiments In the document level and sentence level sentiment classifications assume that each document or sentence focus on a single object and contains only one opinion or opinion from a single opinion holder SVM is better at text classification and use of ontology makes SVM suitable for the application.

2.3.User Intention Understanding From Scratch

The main evaluation criterion of the performance is the prediction accuracy of all users in the test set. We can observe that on overall, the method Threshold-V achieves the best accuracy of 67 percent. The drawback of the system is that the use of a numerical classifier led to unwanted overheads

The discipline of artificial intelligence is wide-spread across various fields and has a wide variety of sub-domains.

Support Vector Machines is a Machine learning algorithm which can be used for the following purposes:

- Classification
- Natural Language Processing

It attempts to label the vector according to pre-defined classes using a dividing hyper-plane. Finding the right hyper-plane is searching for the saddle point of the Lagrange function. It is equivalent to quadratic programming containing dual variables. SVM requires solution of the following optimisation problem. This is a supervised algorithm and hence needs a training data set to train the classifier and then, that classifier can be tested by using the testing data set.

SVM uses specific kernel functions to construct a hyper plane that is used for classification. These kernels are the basis for finding the correct hyper-plane among the many possible hyper-planes in the given situation that divides a particular vector. The 4 basic kernel functions are as follows:

- Linear Kernel
- Polynomial Kernel
- Radial Basis Function Kernel
- Sigmoid Kernel

Any of these kernel functions are used for designing the classifier according to the requirements of the problem. These kernels have the following values associates with it:

- Kernel Function Type
- Values of Kernel Function Parameters
- Values of Regularisation Parameters

These values should be calculates meticulously irrespective of the choice of the kernel because they largely influence the results of the classifier and its accuracy. Any Error or miscalculations in these values can have a heavy toll on the output and the end-results.

3. METHODOLOGY

3.1. Image Processing

Step 1: Take the dataset of 5500 images
Step 2: Load the image in python
Step 3: Perform image processing on it to get only the required part of the image
This can include getting rid of the background, finding the outline, etc
Step 4: After the image has been processed, extract the required features from the image
Step 5: Store the extracted features into an excel file
Step 6: This file will form the training and testing data set for the classification algorithms which are to be used for the purpose of classification

3.2. Classification

Step 1: Load the data into Python for classification
Step 2: Pre-process the data if required
Step 3: Split the data into training and testing data set
Step 4: Form classifier models of the algorithms stated previously
Step 5: Train the classifier with the training data set obtained in step
Step 6: Test the classifier which has been created in the previous step

3.3 Vet Locator

Step 1: The pet breed has been identified in the previous steps
Step 2: The location will be obtained by calling an external API for the location detection purpose
Step 3: The system will then query the database to find the vets which can be suggested to the user
Step 4: The user will book an appointment with the vet
Step 5: The user will have a follow up session with the vet

3.4 User Interface

Step 1: Create a User interface
Step 2: Upload an image onto it
Step 3: Click on the submit button.

4. System Requirement

4.1. Hardware Requirements:
Workstation with minimum 4 GB Ram, i5 core processor (or anything equivalent), 500GB Hard Disk Space

4.2. Software Requirements
Python 3.6.3
Microsoft Excel
Web Browser (Google Chrome Preferred)

4.3. Functional Requirements
Technologies
Image Processing
Image Classification
Language
Python
Platform
Python Application
Frameworks/APIs

4.4. The following frameworks /APIs will be required
API to detect user location
Sklearn
Pandas
Numpy
Tkinter
Python CV
Android Studio for follow ups
Video Conferencing API

4.5. Objectives of the project:

We aims to achieve the following through this project:
Provide an intelligent and interactive system for pets with unknown breeds
The system will use AI to determine the underlying breed of the pet and the doctors who can treat the pet based on the user's location.
This will be done by a high end and high computation processing system
The system interacts with the user by predicting the breed of the pet.
Can be used on an individual level
This system can be used by the pet owners
Design a system with a highly usable UI
The system has an underlying objective of getting handy treatment for fancy pets.

5. PROPOSED SYSTEM

5.1 RESULTS:-

Fig 3. Excel sheet

Fig.4 Creating Classifier

Fig.5 Location Module
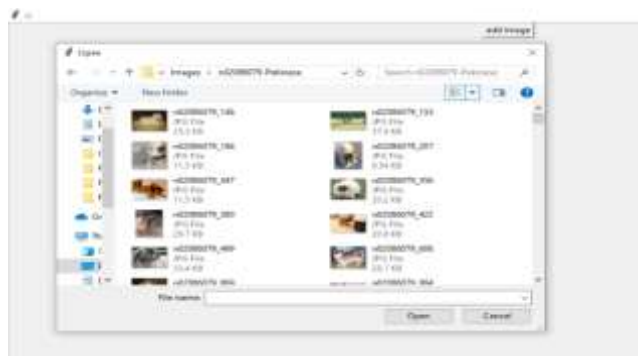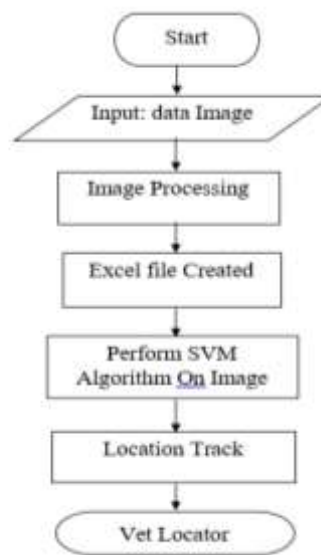

Fig.6 Pet Images

6. FLOWCHART

Fig.7 Flowchart

7. CONCLUSION

The proposed system as planned after extensive research during a literature survey includes the following features: Implementation of Image processing functionality to produce the output which can be passed on to the classification stage for the purpose of identification of the breed of the pet.

8. FUTURE WORK

We aim at creating the following modules for the system

A. Android App for the User Interface

B. Image processing module for processing the image input by the user

C. Classification module to identify the pet which is given as input

9. REFRENCES

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