Complete Animal Care System using Clustering Algorithm: CACS

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Abstract— **In this proposed work, we intend to initiate a adaptive plan to help the animals**. **It not only changes the environment but does also helps the various systems to enact upon it and have a complete healthcare system for animal in one roof. By doing so it does provide information of the needful places where those animals can be admitted, so that they can be taken care of. The enhancement of work can be done by choosing appropriate initial animal center to converge quickly to the local center. Animal care center enhances the way with an ease to access the information about what kind of animal a person wants to adopt accordingly. Also the availability of that animal in the specific center allows the user to get through the center. The randomness of the Animal Center managed and controlled, so as to put a limit on the number of iterations to be carried out in the conventional algorithm**.

Keywords— Clustering, K means clustering, Animals, Centers, Vet Hospitals, NGOs, ZOOs, Vets, Forum, Centroid.

I. INTRODUCTION

As the technology is increasing nowadays our view on how the animal system should act to solve certain problems is also uprising. This project involves discovering how the previous system used to operate and how the enhancement in the technology can be further made for improvising the system so that animals could get proper care by using K-Means Clustering technique. The clustering technique is one of the most efficiently organized methods, that woks on clustering the centers according to the user. The system application is accessible to the users so that they can adopt the animals or admit the animals found on the street so that they could get appropriate care. Also the animal care center augments the way with an ease to obtain the information about what kind of animal a person wants to adopt accordingly. The availability of that animal in the specific Center allows the user to get through the Center. The formatter will need to create these components, incorporating the applicable criteria that follow. Complete animal care basic concept is to integrate all the entity together with user having anytime access to the system with which he/she can directly consult the doctors for their pets, also can view the animals in the adoption centre and can contact them. Users can also contact NGOs and Zoos. An animal centre is a place where stray, lost, abandoned or surrendered animals, mostly dogs and cats, and sometimes sick or wounded wildlife are brought and taken care of. Also all animals are put under a system when a user wants to adopt an animal can do it via the centre. A user can contact the animal centre to register animals found on the street so that they can be taken care of under the centre. Animal centre arranges the data of animals according to the type so that user can get the information easily.

A. Need

- When a person needs to adopt a pet, he/she can operate this application from home or anyplace.

- When an individual comes across an injured stray, he/she can use this application to call an ambulance or take them to a nearby vet hospital/animal center.

- NGOs can access this application to ask the users to join them in their support so that they can spread awareness about strays.

- If a pet is missing/ not to be found, an individual can post the details on the portal and ask the others users for assistance.

B. Existing System [11]

Presently there is "DATA MINING FOR HEALTHCARE MANAGEMENT" system for humans. It is the field relating to leadership, management, and administration of hospitals, hospital networks and health care systems. It basically has the key dimensions on:

- Diagnosis and Treatment
- Healthcare Resource Management
- Customer Relationship Management
- Fraud and Anomaly Detection

Hence we decided to make a complete healthcare system for animals which will be a turning point in the improvement of animal's healthcare, welfare and hygiene.

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C. Aim and Objectives

- The aim of this work is to improve the services related to pets/strays.
- The main aim is that many applications (for e.g. direct contact to vets, location search of hospitals, adoption centers, NGOs etc.) will be integrated in one web application.
- It will provide elegant management to the users; any individual would be able to use this application on the go.

D. Problem Statement

- Currently, good and legal vet hospitals are difficult to find and with our proposed system we shall be able to find the legal vet hospitals/animal centers.
- We can create a network of users who can assist an organization/ a particular individual, for spreading the awareness by helping the strays reach a proper care center, which is difficult in current scenario.
- A user/ organization can connect to many different animal lovers.
- Direct contact to the vets which was not possible can be made available in the current system.

II. LITERATURE REVIEW

M.Sakthi and Dr. Antony Selvadoss Thanamani, had used PCA method and was replaced by Kernel Principal Component Analysis (KPCA) [1] for effective determination of initial centroids. The proposed technique had performed data clustering with Principal component obtained from KPCA. It had clustered the provided data set into k sets. Experimental results were that the median of every set was used as better initial cluster centers and then assigned every data points to its nearest cluster centroid.

Jadhav Swapnil N, Prof. Sarita V. Verma, had presented an approach in regards with image segmentation by applying K-means clustering algorithm [2]. The algorithm provided new aspect of image segmentation which was widely used for image retrieval. The algorithm showed intended results of tentativeness for improving clustering with respect to computational time. Experimental results were that K-means Clustering algorithm was used and it was more efficient and gave better results, so K-means clustering algorithm was implemented.

Sudhir Singh and Nasib Singh Gill, had tried to overcome the limitations of K-means algorithm [3]. The actual K-means algorithm takes lot of time when it is applied on a large database. It described the behavior of K-means algorithm. Euclidean distance between two points/objects/items in a dataset was used. It concluded that the paper performance evaluation was done for proposed algorithm using Max Hospital Diabetic Patient Dataset.

Prof Shrikant Lade, Prof Dr. S. S. Prabhune, Niraj N Kasliwal, presented the integrated data mining processing technique to find appropriate initial centroids in data clustering process by k-means algorithm [4]. The processes included data cleansing, pre-processing, and finding features relation to get appropriate features.
The clustering process had compared different initial selection schemes: static selection and random selection. It was concluded that K-means represented the processes for finding appropriate initial clustering centroids and selecting the most relevant features from datasets.

D. Aruna Kumari, presented the cardiologic study [5]. The developed model was used for Doctors or Para-medics to find out the patient's level in the cardiologic disease that dealt with human heart disorders, it deduced the medicines required in seconds and had proposed them to the patient. Experimental results were that in order to maintain the reusability, K-means clustering algorithm was used.

Trupti M. Kodinariya, Dr. Prashant R. Makwana, had presented the various methods evolved by researchers for finding initial clusters for K Means [6]. The procedure act according to an easy and simple way to classify a given arrangement through a few number of clusters (assume k clusters).

G. Chamundeswari, Prof. G. Pardasaradhi Varma, Prof. Ch. Satyanarayana, had presented the results of the analysis of running k-means algorithm in mat lab with two UCI repository data sets, iris plant and haberman's survival data [7]. The result procedure stated that using k-means algorithm in mat lab, technical computing problems was faster than with traditional programming languages, such as C, C++, and Fortran.

III. PROPOSED SYSTEM

The concept of Animal health care would make the system peculiar. To add with this we are introducing the concept of local doctor search and chat forum where the users can communicate with the vets and can even watch some animal related videos(for e.g. helping animals in the birth, cleaning animal wounds, hygiene related to animals etc.). Cluster Analysis for Animal care center is one of the most important data mining techniques which help the researchers to analyze the data and categorize the attributes of data into various groups. K-Means is one the frequent partitioning algorithm used in clustering so that proper data is portioned according to the system. In the proposed work, it is used to choose the initial cluster centers instead of selecting them arbitrarily which would lead us to improvised solutions and lessen the complexity of the conventional k-means algorithm.
The proposed system will be useful for the users when they accidently come across a wild snake, they can immediately locate a nearby zoo or call a respective person, when they see an injured animal, they can contact for medical emergency. All these things can be done easily, and the users won't be able to browse through many different sites for the same.
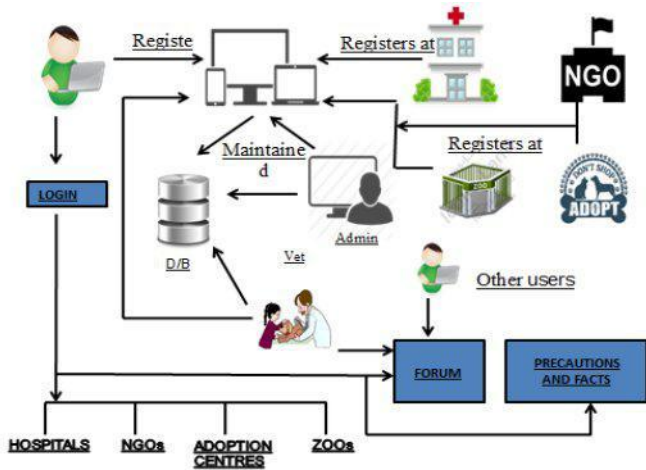
Figure 1: - Block Diagram of the proposed system: CACS

When a user registers into the portal, the data is stored and maintained by the admin. A user depending on his requirements gets the information through the data of the organization already stored.

IV. METHODOLOGY

K-means is one of the straight-forward algorithm which uses unsupervised learning method to solve clusters. K-means is relatively low in price than other clustering algorithms and it is a best solution in solving clustering problems. [10] It is a simplest algorithm to implement and to run. It solves two problems:

- Determining the number of categories that exist in the system, and;
- Determining the members of each category, in the system.

K-means is one of the easiest non-supervised learning algorithms that solve the well-known clustering problem. The strategy follows a simple and non-difficult way to classify a given data set through a certain number of clusters (assume k clusters).

1) The main idea to define k centers, one for each cluster. These centers should be placed in a smart way because different location causes different result. So, the better way is to place them as far away from each other.

2) The next step is to take each point which belongs to a given data set and associate it to the nearest center. When no point is pending, the initial step is completed and an early group age is done. At this point we need to calculate again the k new centroids as middle of the clusters resulting from the previous step.

3) After we have these k new centroids, a new binding needs to be done between the identical data set points and the nearest new center. A loop is generated. As a result of this loop we may observe that the k centers change their location step by step until no more changes are done or in other words centers do not move any more.

4) Finally, this algorithm aims at minimizing an objective function known as squared error function given by equation (1):

$$J(V) = \sum_{i=1}^{c} \sum_{j=1}^{c_i} (\|x_i - v_j\|)^2 \qquad \text{--------------------(1)}$$

Where,

   '$\|x_i - v_j\|$' is the Euclidean distance between x_i and v_j.

   'c_i' is the number of data points in i^{th} cluster.

   'c' is the number of cluster centers.

V. CONCLUSION AND FUTURE WORK

In this paper the system will help en number of people who knows or might want to know about animals and how to take care and be cautious of them. Since there will be a direct contact to the vets, the user can get on-the-go assistance. It's a small portal for each and every person, which will bring an animal and a human being together.

The paper produces good starting points. The population has to adapt more to it more quickly according to the problems which they are facing. K-means algorithm will help in smoothening the progress of research in the field of difficulties producing more stable clusters.

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