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Recipe Recommendation System

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Abstract: In this paper, we have proposed a recipe recommendation system that makes use of images of ingredients to recommend a recipe to a person who doesn't know anything about the contents and its proportion in a particular recipe. This system is also beneficial for health-conscious people. With the changing living manners, diet habits are changed and work load has increased which resulted in various diseases, such as diabetes, BP, problems related to heart and so on. All these diseases can be controlled by avoiding uneven and unhealthy food. So it's important to understand that what is the proper diet and in how much quantity it should be taken. Our main aim is to recommend recipes to maintain their health for people with disease and without disease which will satisfy the needs of user. To give the recommendations, recommended system uses the user's profile, their favourite food and details of that food. Clients from various countries, belonging to various cultures are contributing in terms of a large number of new recipes on the web all over the world. Every recipe contains of so many distinct elements. Thus, user might not be able to identify all the ingredients or contents. In this paper we propose a recommendation system for recipe using Convolutional Neural Network (CNN) which is used for supervised learning in order to analyse the data. Recommended Recipe contains diverse ingredients, cooking procedure, categories and so on. The recipe which includes the ingredients mentioned by user with proper nutritional values will be a good recommendation.

Keywords: Image processing, Machine learning, Recommendation system, Collaborative Filtering, Ingredients, CNN

I. INTRODUCTION

Now a days, so many people are changing their life style. They are being very much aware regarding their health issues and the food that causes multiple diseases like BP, Heart problems, Diabetes etc. These type of diseases can be limited in somewhat manner by having daily diet in proper manner according to a particular schedule along with recipes containing suitable amount of ingredients . For having such healthy diet, people should think that what will be good for their health. In such a way , one will add that recipe in their meal or breakfast. Managing such things will be a headache for a working woman if she doesn't know about the cooking. So our recommendation gives solution for such people. Recommendation systems applies CNN technique to analyse the data and retrieve the correct ingredients along with the recommendations of recipes. This helps a user in reducing the searching time to get the recipe and its procedure to cook. Also a user having some disease ,will eat their meal which is best for their disease.

The paper is structured as follows: Section II describes literature survey with basic concepts and terminologies studied before, section III describes proposed work of paper, section IV gives the description of system architecture, last section includes the methodologies and finally, we have concluded the paper.

II. LITERATURE SURVEY

Research results on medicine and health show that people nowadays tend to have some common diseases because of abnormal eating habits, irregular lifestyles, fast-food culture, etc. Diabetes and high blood pressure are just two examples. This study is based on an ontology-based dietary management system established by our group earlier. The main contribution of this paper is to propose a method for synthesizing new recipes based on existing ones, and recommending proper recipes based on machine learning. The new recipes are combinations of several existing ones. They are recommended to the user only if the recipe is contained of proper nutrition. Outlier analysis is used to judge if a recipe is good or not. Some primary experiments are conducted to show the usefulness of the proposed method [1].

Food related web services, such as recipe websites and food journaling apps, are rapidly becoming popular day by day. Data from service providers and that generated by users often coexist in these services. Compared to the former, the latter, due to its randomness and lack of organization, is often difficult to incorporate into common service features like recommendation making and associative searching. This work addresses this problem by investigating the effectiveness of multiple text embedding methods in generating distributed representations of dish titles that accurately capture the concepts of the dishes which these titles are referring to. We evaluated the practical potential of these "food vectors" with a retrieval task and a nutrition estimation task, and concluded that a method based on word embedding and LSTM is most suited for these purposes [2].

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Many people often cook a dish with a cooking recipe on Websites and magazines. Sometimes it may happen that all the ingredients mentioned in the recipe are not available at home. This paper proposes a recommendation system for alternative ingredients. The recommendation ingredients based on co-occurrence frequency of ingredients on recipe database and ingredient category stored in a cooking ontology. The result of the subjective evaluation experiments showed 88% appropriateness for alternative-ingredients recommendation[3].

With the propelled inquire about in restorative science and innovation, nature of our life has enhanced, additionally life traverse has been expanded. With way of life, eat less carbs propensities has changed and work weight expanded which brought about number of sicknesses, for example, diabetes, Blood Pressure, heart issue and so on. These sicknesses can be controlled to certain degree by maintaining a strategic distance from uneven and wrong eating regimen. Thus it is critical to see great eating regimen what's more, admission propensities. Our goal is to prescribe formulas to keep up wellbeing condition for individuals with infection and without infection which will satisfy the client needs. To display the proposals, suggested framework utilizes client's profile, most loved things and formula subtle elements. This express information satisfies the imperatives for the suggestion. In this paper we propose a suggestion framework for formula utilizing imperative information based suggestion technique (CKRM) furthermore, forward checking calculation. The proposed framework recommends formula for diabetes illness which gives enhanced exactness furthermore, review. This portrays proposed framework is effective than existing framework. The motivation to choose this strategy is that it does not have increase issue. The imperatives which meets the ssclient's necessity will be the great formula proposal [4].

III. PROPOSED SYSTEM

In Proposed system we analysing the Android application. The user can register the application. Once the registration is successful, user can login the application. Now the User can upload images of ingredients. These images are displayed in Admin dashboard. The role of an admin is to view this image and substantiate the image. User can also add a new recipe and give the ratings for a particular recipe.

IV. SYSTEM ARCHITECTURE

Following diagram is our system's architecture diagram:

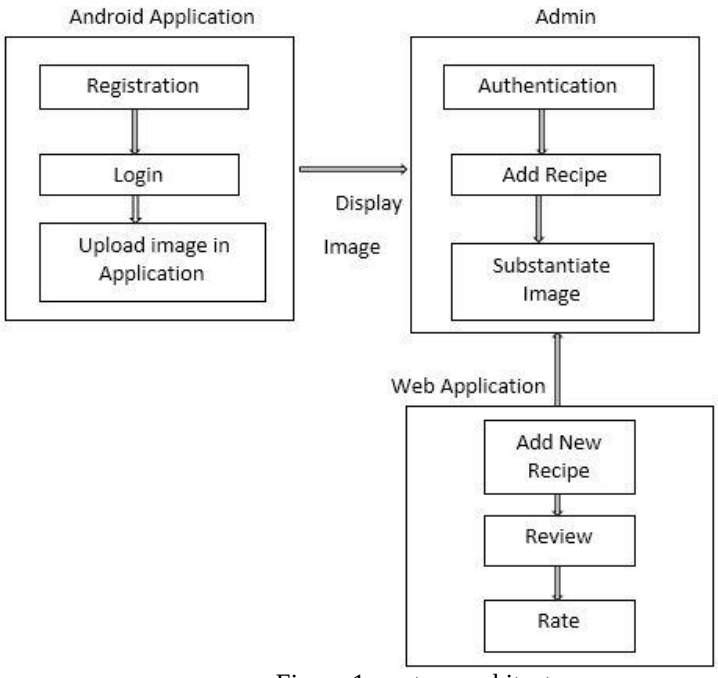

Figure 1: system architecture

In System architecture Admin and user have to register the application. As the registration is successful, user can login the application. Now the user will use this android application for detecting the images of ingredients and upload them. The uploaded images are compared with images in database. For developing this object detection app we are going to

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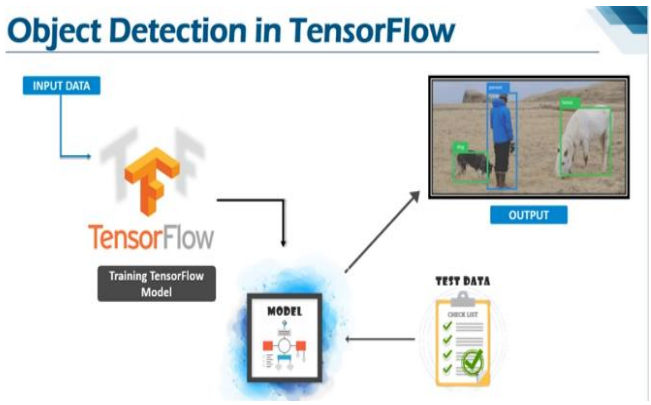
use TensorFlow API. TensorFlow is an API used for object detection which uses pre-trained models. The matching image will be retrieved and displayed to user.

This gathered search information is passed to recommended module of proposed system. In this recommendation actual recommended recipe for user is present. Then this recipe will show on user profile as recommended recipe with its nutritional values. By looking at the nutrition details, user can decide his/her diet regarding their health issues.

Here workflow of object detection in TensorFlow is explained in below diagrams:



V. METHODOLOGIES

The system is divided into three parts according to functions performed by individuals. In this paper, we propose the idea which needs to collect the data from different resources like recipes, ingredients, nutrition values for different recipes so that we are divide the system in two subsections:-

1. Admin:- In admin side all data is related to recipe like add recipe, delete recipe, manage ingredients this operations Admin need to perform the verification of recipes posted by the user with some basic user management functions.
2. User:- Initially the user is authenticated by the application. Now user can upload the images of ingredients using the facility provided by the application. The uploaded image will be displayed on webpage and system identifies the ingredients from the Image and suggest recipe according to ingredients with nutritional contents along with their values.

VI. CONCLUSION

Recommendation system is the mechanism of recommendation of recipe. The paper shows the detailed description of the system. Generally speaking, the consensus result could be achieved by iteratively refining the local training result. The system is helpful for food lover people and also for health conscious people. The proposed system features a low computation cost and confidentiality of the training set.

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