Synopsis - Final Year Project
Recipe Recommendation System
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INTRODUCTION

There are several cooking apps or websites available today that are used to find recipes based on some keyword, like the name of the food ingredient or type of cuisine, etc. These apps are mindful of the needs and interests of their users, but they fail at identifying their user's constraints, i.e., a limited number of food ingredients. In such cases, users find themselves shopping for ingredients or they decide to substitute the missing ingredient with something else. To help users avoid such adjustments, image recognition can be employed to identify food ingredients that are already available at their disposal and recommend recipes based on those ingredients.The user can also just select ingredients from a list of ingredients and recipes would be recommended respectively.
The main objective of the proposed system is to assist users to decide what they can cook with the available resources. We intend a user to use our system not only at home while cooking but also during grocery shopping. By putting the images of the ingredients, users will immediately build a plan or have an idea of what they will be cooking that week, based on our recommendations.

2. PROJECT CONCEPT

2.1 Abstract

In this project, we propose a recipe recommendation system employing image recognition of food ingredients.
It is a web application that either performs image recognition on the uploaded images and recommends recipes that contain the recognized ingredients or recommends recipes based on the ingredients that the user selects.
The recommendation system uses the labels of the identified images to display a list of recipes that contain most of the identified ingredients.

2.2 Objectives

The objective of the project is to build a web application that would recommend different recipes to the users based on the ingredients that the user provides. Users can upload an image or can just type the ingredients and based on the ingredients a delicious recipe would be recommended to the user.

2.3 Literature Review

We are referring to a research paper published under IEEE in 2019. The paper aims at recommending recipes to users based on the input they provide to the application. Collaborative filtering (CF) is the approach for generating recommendations that fits real and simulated data and Bayesian Optimization. CNN is used for classification of input images that the user provides.

2.4 Problem Definition

It is always a tough task for many people to decide what to prepare for their meals, be it breakfast, lunch, or dinner.
And even if they finalize a dish, the next problem that some of them face is the lack of the necessary ingredients required for the dish. Then what most of them do is either replace it with something similar or switch to some new dish.
Also, many busy working professionals and bachelors find it difficult to prepare meals as they have limited ingredients and time constraints as well.

So the best solution to the above-mentioned problems is to build an application which could recommend different recipes based on the ingredients they have so that they could eat dishes of their choice and also save time on searching for the recipes.

2.5 Scope

Many people need an application to suggest recipes with the food ingredients that are available to them. For this, we are building a web application that will take ingredients as input from the users either as images or as text. Many people don't have knowledge of various ingredients. So they can upload an image of the ingredient. We will be taking a recipe dataset to test and train the model for recommendation. Front-end consists of user login along with the recommendation system.

2.6 Technology Stack

- Machine learning
  - Training and Testing the model
- Database - MongoDB or SQL
  - MongoDB/SQL is used to store, retrieve and access the data.
- Programming language - Python
  - Used for building machine learning model,
  - Used for building a code to recommend the recipes.
  - Flask An API Python used to build web applications (front - end)
- Dataset
  - Recipe Ingredients dataset from Kaggle
  - Recipe dataset from Kaggle

2.7 Benefits for society

1. Busy working professionals and bachelors can save time on searching for recipes based on the ingredients they have. Instead, they can just upload the images of the ingredients that they have or either select from the ingredients listed and directly would be able to try the recipes recommended by the model.
2. Even normal people can try different types of delicious recipes based on ingredients that they already have or can buy ingredients from the market and straight away check for the suggestion of recipes based on the ingredients they just bought.

2.8 References :

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