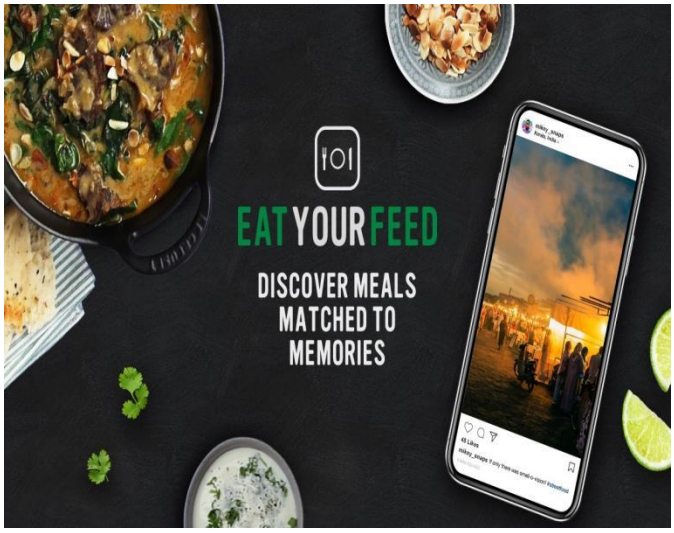
PLATE TO PALATE : ENHANCING CULINARY EXPERIENCE WITH RECIPE RECOGNITION



SMARTBRIDGE
Let's Bridge the Gap

SUBMITTED BY

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CONTENTS

CNN

6. SYSTEM DESIGN

Introduction to input design and output devices

7. IMPLEMENTATION

Modules

8.**RESULTS**

Output Screens

9.CONCLUSION

ABSTARCT

The "Recipe Recognition" project aims to revolutionize culinary exploration and recipe discovery by employing Convolutional Neural Networks (CNNs) in tandem with traditional Recognition methodologies. This novel approach offers a more holistic understanding of recipe content, enabling more accurate and personalized Recognitions tailored to individual preferences and dietary requirements. The system begins with the collection and preprocessing of a diverse dataset encompassing recipe images and corresponding text descriptions. These descriptions include ingredients, cooking instructions, and other relevant details. The CNN models are then trained on this dataset to extract meaningful features from recipe images and text, leveraging the spatial hierarchies captured by the convolutional layers for image recognition and the semantic understanding encoded by the subsequent layers for text analysis. The

integration of CNNs enhances the Recognition process in several key ways. Firstly, the image recognition capabilities enable the system to identify visually similar dishes, facilitating Recognitions based on aesthetic appeal and presentation. Users can explore recipes that resonate with their culinary preferences simply by browsing through visually engaging images. Additionally, the CNNs are trained to recognize key ingredients and cooking techniques from recipe text, allowing the system to generate Recognitions based on ingredient availability and dietary restrictions. For instance, users can input their pantry items or dietary preferences, and the system will suggest recipes that align with their needs. Ultimately, the "Recipe Recognition System" aims to empower users to discover and explore a wide variety of culinary delights tailored to their tastes and dietary preferences. Whether seeking quick and easy weeknight meals or gourmet creations for special occasions, our system will serve as a valuable tool for culinary enthusiasts, novices, and seasoned chefs alike, fostering a deeper appreciation for the art and joy of cooking.

INTRODUCTION

In the contemporary digital landscape, the abundance of online recipe content presents both opportunities and challenges for culinary enthusiasts. While the internet offers a vast repository of culinary inspiration, navigating through countless recipes to find dishes that align with individual tastes, dietary preferences, and ingredient availability can be daunting.

To address these challenges, we introduce the Recipe Recognition System, a novel platform designed to revolutionize recipe discovery and meal planning. Leveraging state-of-the-art technologies such as Convolutional Neural Networks (CNNs) alongside traditional Recognition methodologies, our system aims to provide users with intuitive, personalized, and visually engaging recipe Recognitions. By analyzing both image and text data associated with recipes, the system extracts meaningful features to enhance Recognition accuracy.

Problem Statement

users frequently encounter difficulties in finding recipes that align with their dietary restrictions and ingredient availability. This highlights the need for an innovative solution that combines advanced technologies with traditional Recognition methodologies to provide tailored recipe Recognitions.

The Recipe Recognition System aims to address these challenges by leveraging Convolutional Neural Networks (CNNs) to analyze both image and text data associated with recipes. Ultimately, the goal is to simplify the recipe discovery process, inspire culinary exploration, and enhance the overall cooking experience for users in an increasingly digitalized world.

Objective of the Project:

The objective of the Recipe Recognition System project is to develop an innovative platform that transforms the way users discover and plan

meals. Leveraging Convolutional Neural Networks (CNNs), the system aims to analyze recipe images and text data, extracting meaningful features to enhance Recognition accuracy. Emphasis is placed on recognizing visually appealing dishes, identifying key ingredients, and considering cooking techniques to improve Recognition relevance. Through user-friendly interfaces and iterative refinement based on performance metrics and user feedback, the system aims to empower users to explore diverse culinary options effortlessly. Ultimately, the project seeks to simplify meal planning, inspire culinary creativity, and enrich the overall cooking experience for users.

SYSTEM ANALYSIS

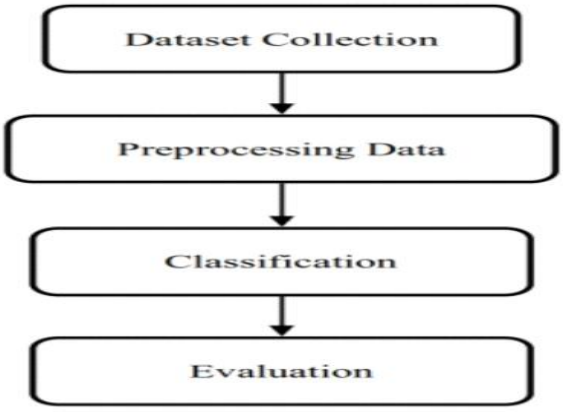
Existing system:

The current methods of recipe identification and categorization largely rely on manual input or the use of predefined tags and labels in recipe databases. These systems typically require users to either search for recipes by name or input ingredients to retrieve matching recipes. While these systems are useful, they lack automation in recognizing and classifying recipes directly from visual content, such as images. Furthermore, existing systems do not leverage advanced deep learning techniques to accurately recognize recipes from images, often relying on keyword matching or text-based approaches.

Proposed system:

The proposed Recipe Recognition System aims to revolutionize recipe identification by using a Convolutional Neural Network (CNN) to recognize recipes directly from images. The system will be capable of processing and analyzing an image of a dish and classifying it into predefined categories based on learned features.

Block Diagram



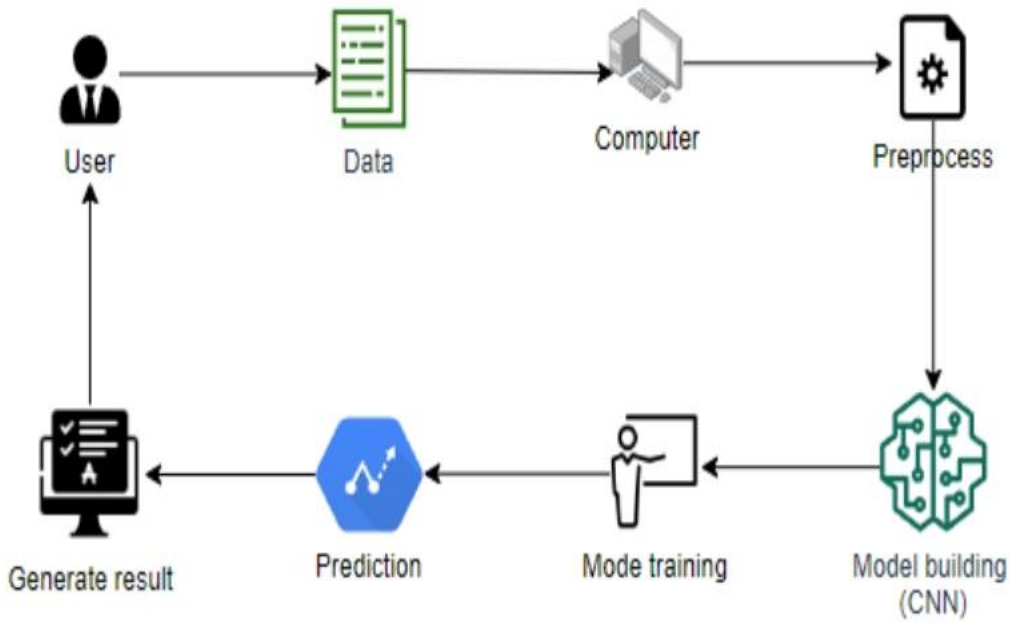
REQUIREMENT ANALYSIS

Function and non-functional requirements

Functional Requirements: These are the requirements that the end user specifically demands as basic facilities that the system should offer. All these functionalities need to be necessarily incorporated into the system as a part of the contract. These are represented or stated in the form of input to be given to the system, the operation performed and the output expected. They are basically the requirements stated by the user which one can see directly in the final product, unlike the non-functional requirements.

Non-functional requirements: These are basically the quality constraints that the system must satisfy according to the project contract. The priority or extent to which these factors are implemented varies from one project to other. They are also called non-behavioral requirements.

Architecture:



METHODOLOGY:

CNN:

Convolutional Neural Networks (CNNs) have indeed transformed many areas of computer vision, including the specific domain of food classification. In this context, CNNs are particularly effective because they can directly learn to recognize and differentiate among various

types of foods from images, which is crucial for tasks like nutritional analysis, diet tracking, and automated cooking assistance.

In a food classification task, the convolutional layers of a CNN play a critical role. These layers apply numerous filters to the input images to capture and encode different visual features, such as textures of a grilled surface, shapes of different fruits, or colors typical of certain foods. For instance, the early layers might detect edges and colors, while deeper layers could identify more complex patterns like the flakiness of a pastry or the glossiness of fresh vegetables.

SYSTEM DESIGN

Introduction of Input Design:

In an information system, input is the raw data that is processed to produce output. During the input design, the developers must consider the input devices such as PC, MICR, OMR, etc.

Output design:

The design of output is the most important task of any system. During output design, developers identify the type of outputs needed, and consider the necessary output controls and prototype report layouts.

UML Diagrams

- Use case diagram
- Class diagram

- Sequence diagram
- Collaboration diagram:
- Deployment diagram
- Activity diagram
- Component diagram

IMPLEMENTATION

MODULES

System:

Create Dataset:

In this module, the dataset containing images for recipie prediction is divided into two subsets - the training dataset and the testing dataset. This split is typically done with a test size of around 20-30%. The training dataset is used to teach the model, while the testing dataset is used to evaluate its performance.

Data Pre-Processing:

Data preprocessing is a data mining technique which is used to transform the raw data in a useful and efficient format.

(a). Missing Data:

This situation arises when some data is missing in the data. It can be handled in various ways.

(b). Noisy Data:

Noisy data is a meaningless data that can’t be interpreted by machines. It can be generated due to faulty data collection, data entry errors etc.

2. Admin:

Login

Admin can login with the default credential..

Add food details:

He can add food (name, image, incredents, making procedure, youtube link for making procedure).

And he can also Edit and ddelete those food details.

3. User:

Register and Login

In this application, users are required to register and create their own accounts to access the system's functionalities. Upon registration, users can log in using their credentials to avail themselves of the various features and services provided by the application.

prediction:

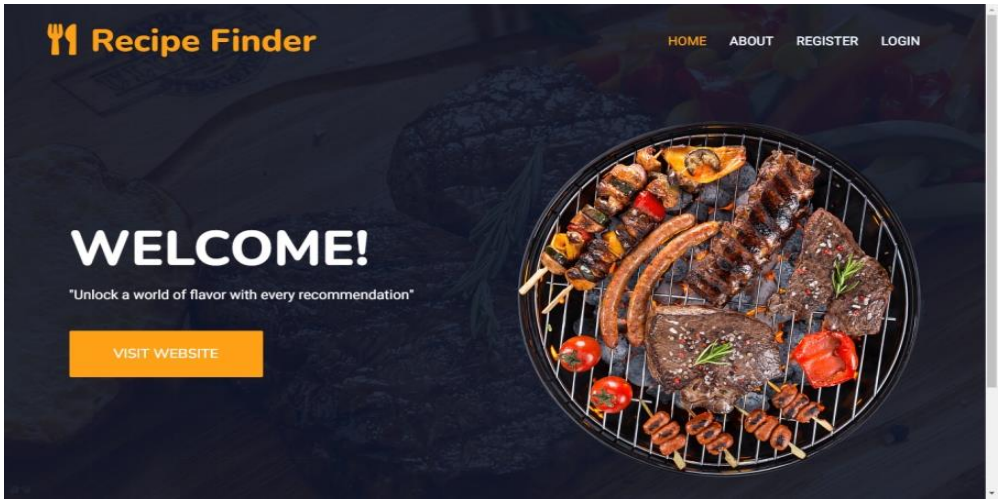
It loads the model that which was created from the training part, choose the images from the system. And then the image is changed into array using img_to_array method.

For changing binary values we perform matrix division operation. After converting the binary values we load binary converted data to model for prediction.

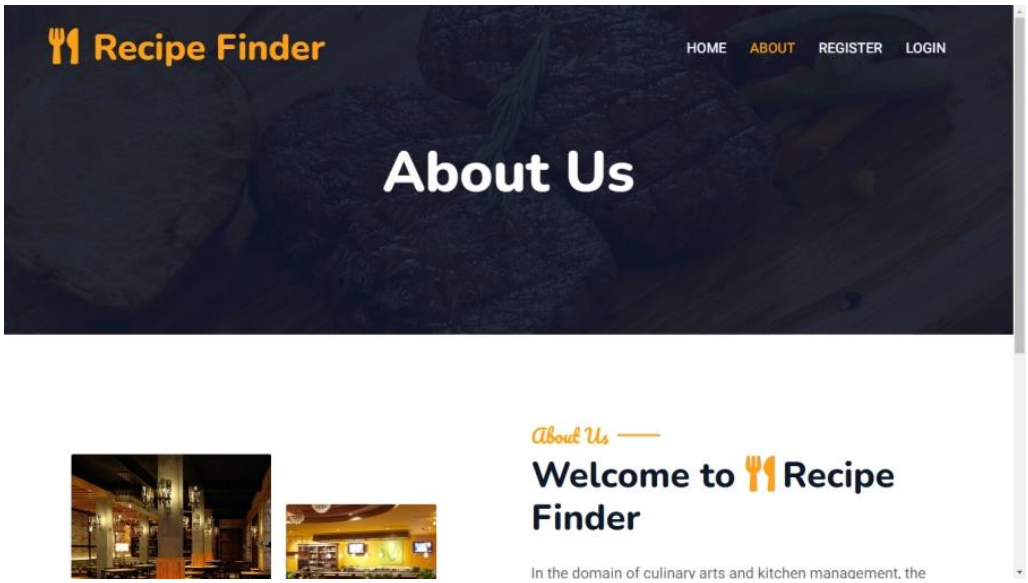
After predicting we will get recipe name.

RESULTS:

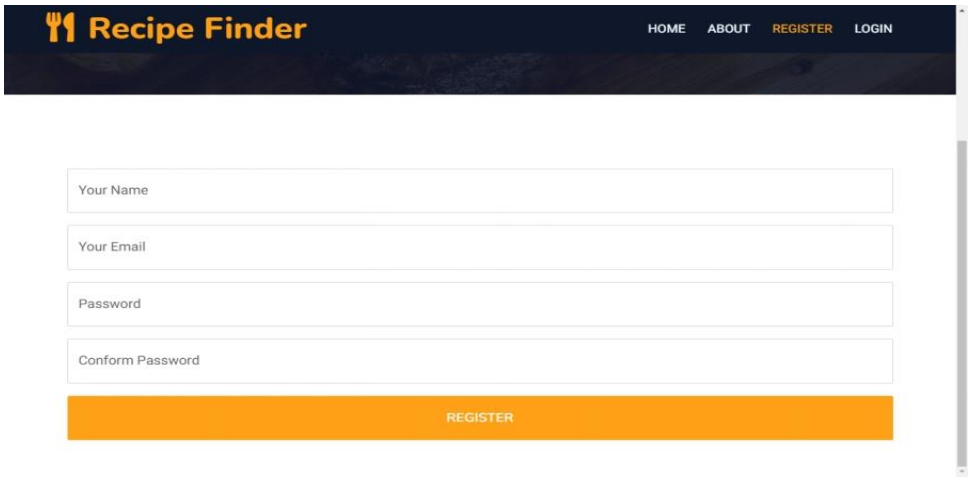
HOME PAGE:

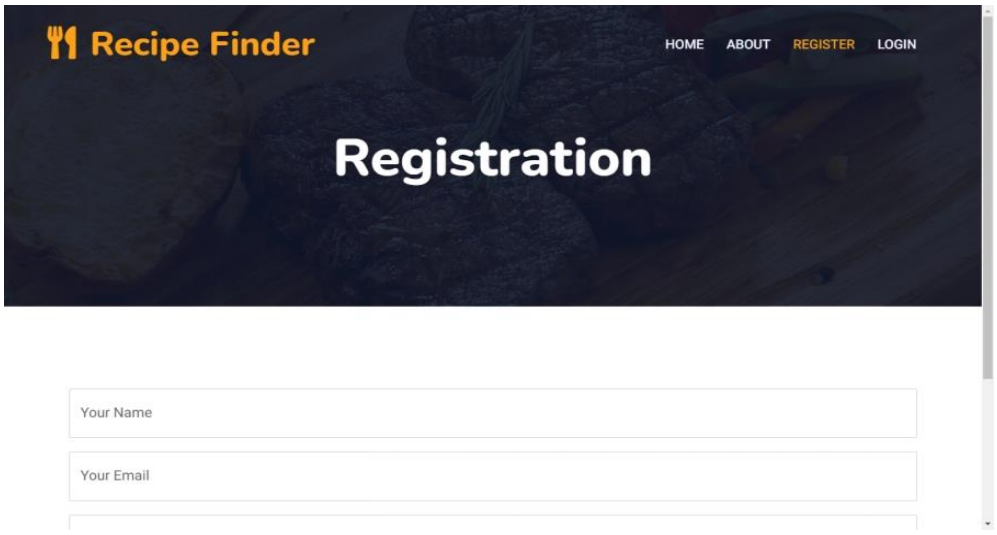


ABOUT PAGE:

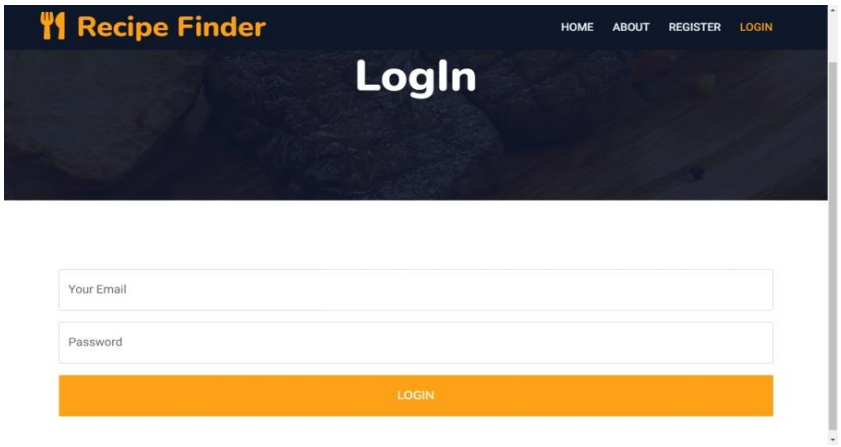


Registrations Page:

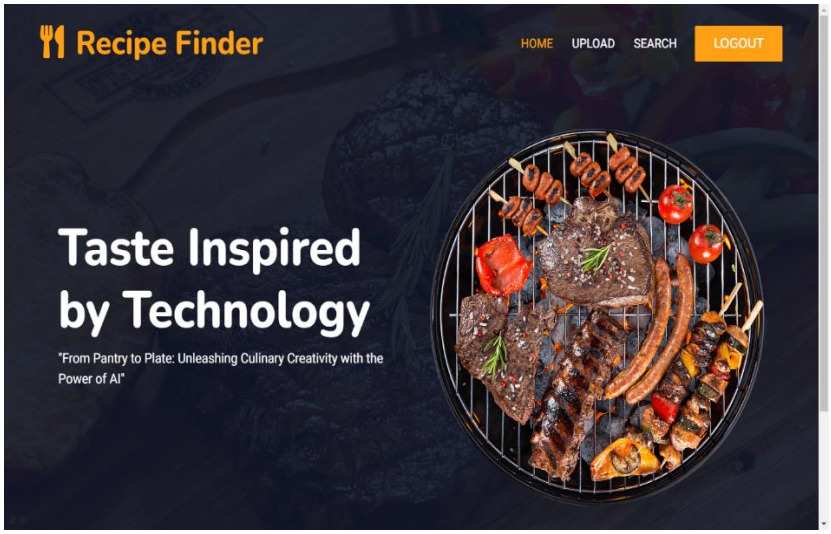




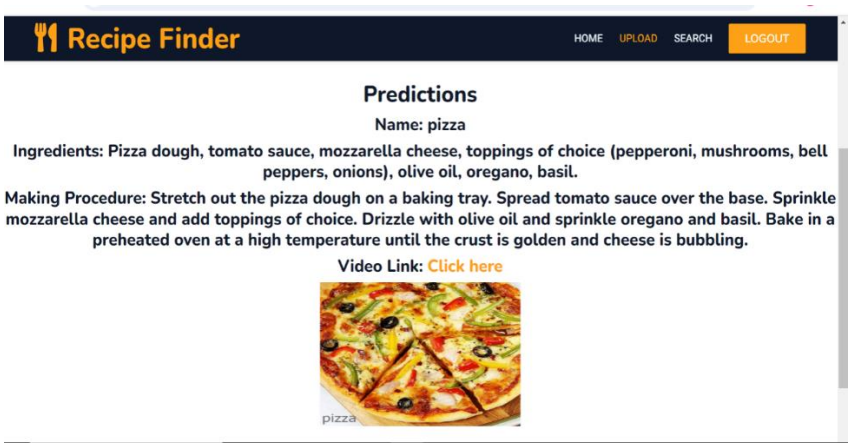
LOGIN PAGE:



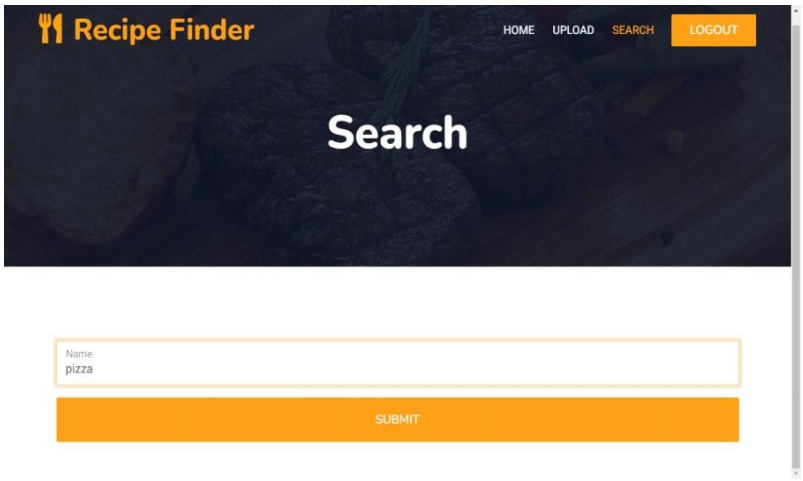
User Home Page:



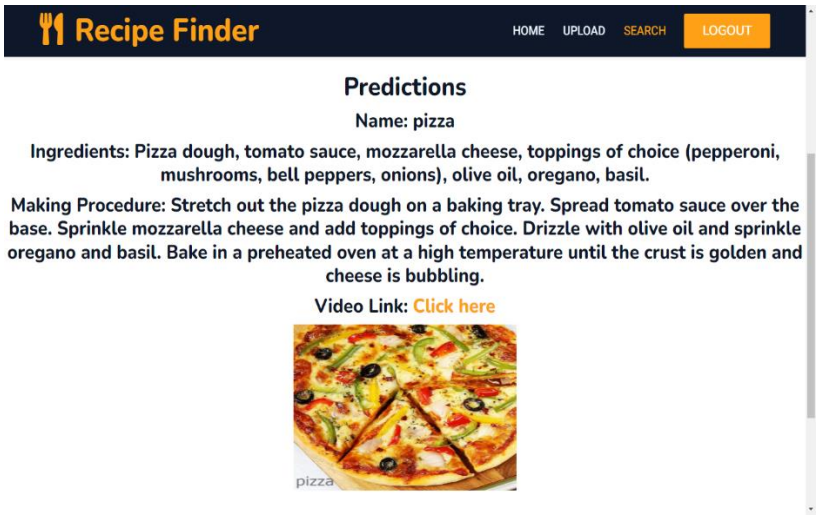
Upload Image and Result Pages



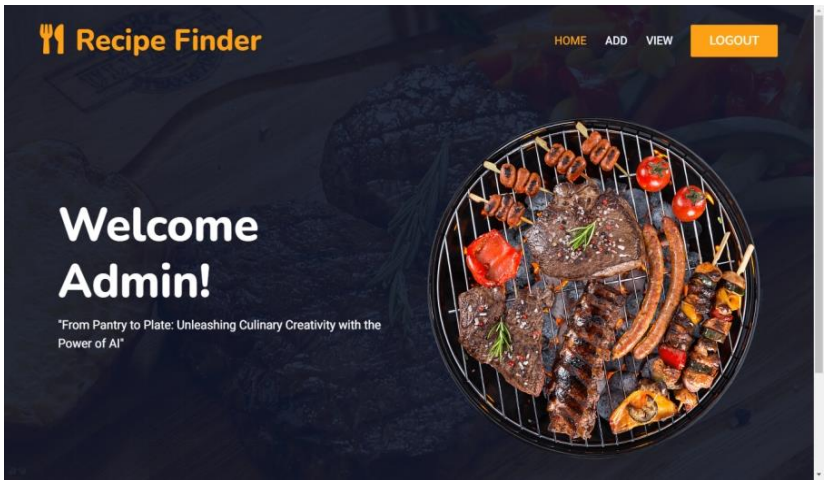
Text Upload Page:



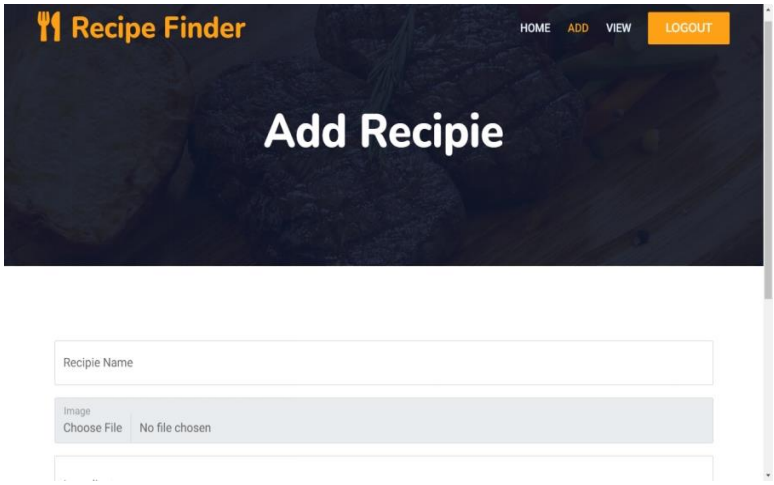
Text Result Page:

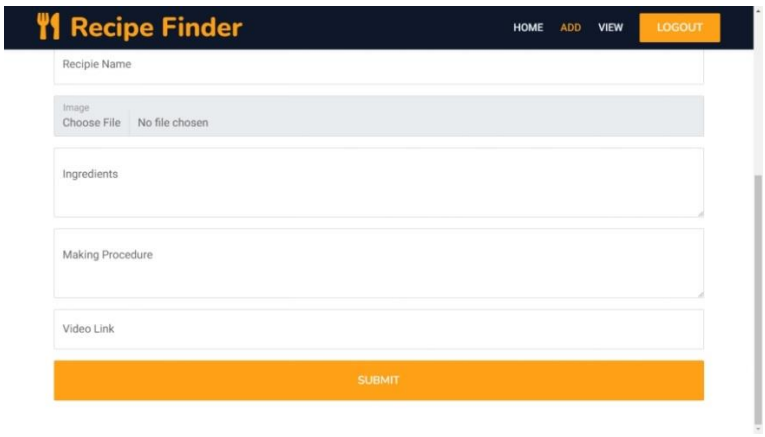


Admin Home Page:

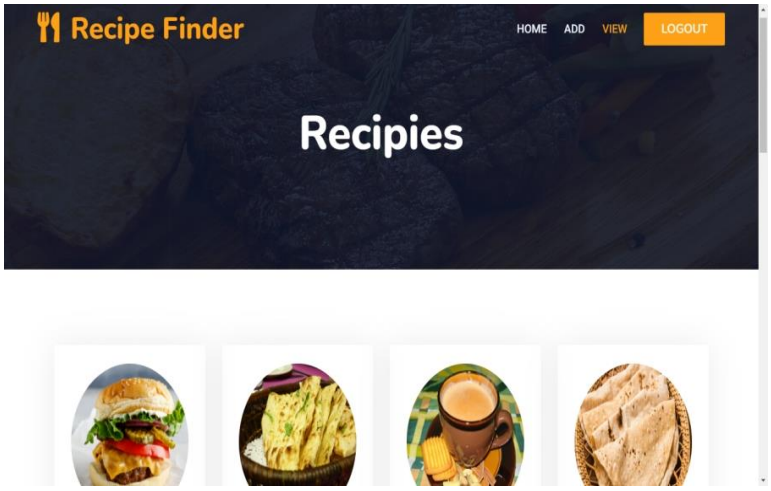


Add Recopies Page:

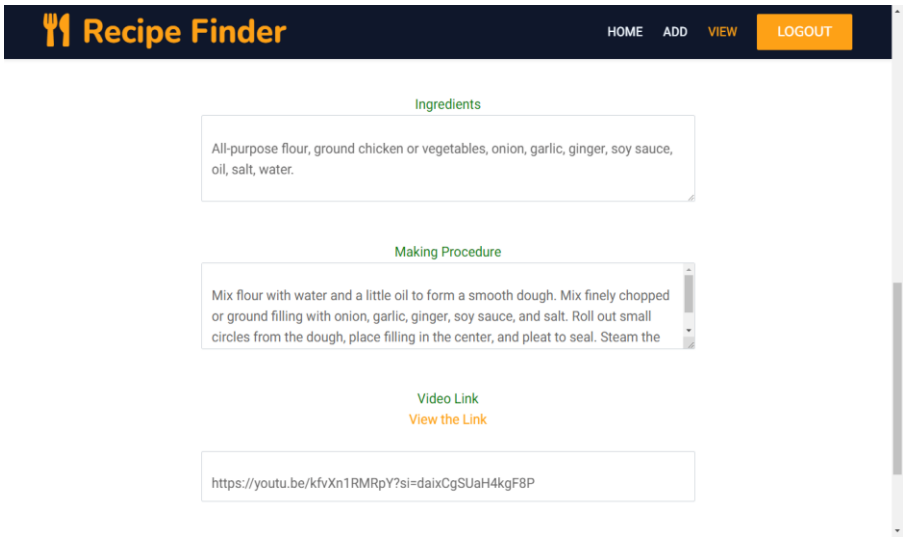


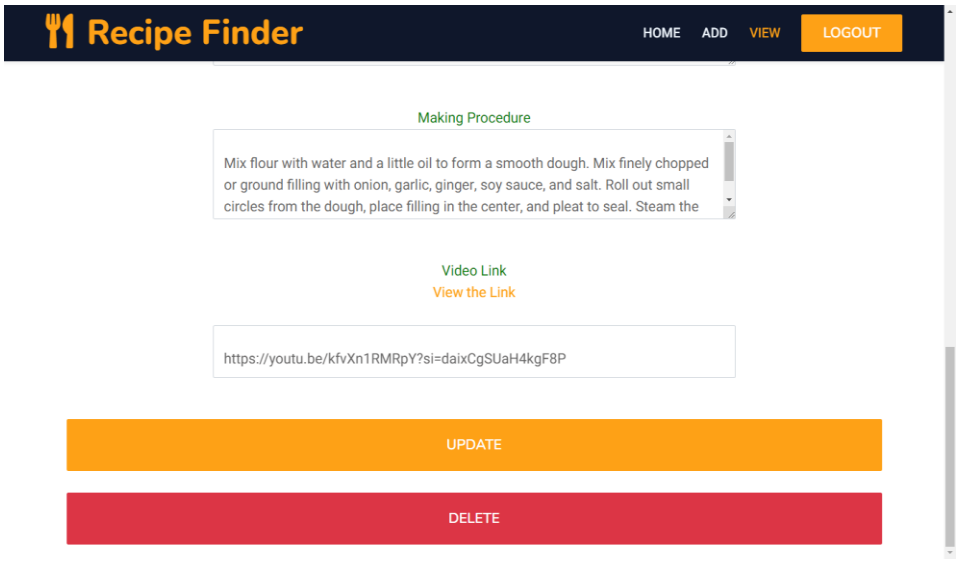


View Page:



Recipe Modification Page:





CONCLUSION

In conclusion, the Recipe Recognition System represents a significant advancement in the field of culinary exploration and meal planning. By integrating Convolutional Neural Networks (CNNs) with traditional Recognition methodologies, the system offers a comprehensive and personalized approach to recipe discovery.

The proposed system addresses the limitations of existing methods by leveraging advanced technologies to capture the complex and nuanced characteristics of recipes. By considering visual elements such as presentation and aesthetic appeal, as well as textual attributes like ingredients and cooking techniques, the system offers a holistic understanding of recipe content, leading to more satisfying and enjoyable culinary experiences for users.

Moving forward, further research and development efforts will focus on refining the Recognition algorithms, enhancing user interaction interfaces, and continuously evaluating the system's performance to ensure its effectiveness and adaptability in meeting the evolving needs of users. Ultimately, the Recipe Recognition System aims to inspire culinary exploration, foster creativity in the kitchen, and enrich the overall cooking experience for users worldwide.