



**Kallam Haranadhareddy Institute of Technology**  
**(Autonomous)**

Chowdavaram, Guntur Dt. Amaravathi, Andhra Pradesh

Affiliated to JNTUK, Approved by AICTE, New Delhi

# **PLATE TO PALATE : ENHANCING CULINARY EXPERIENCES WITH RECIPE RECOGNITION**

**UNDER THE GUIDENCE OF**

**CH. H S CHANDRA MOULI, M.tech**

**PRESENTED BY**

J. VYSHNAVI (218X1A0529)

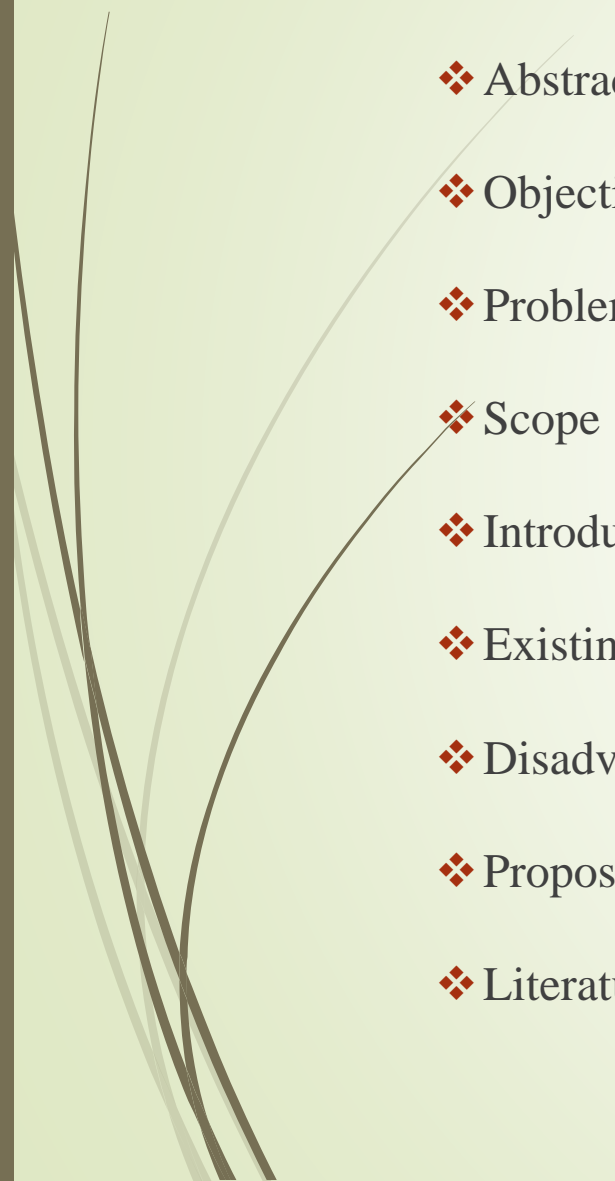
M. RAVALI DEEPTHI (218X1A0542)

B. K.RAM PRASAD (218X1A0543)

D.PRABHAS (218X1A0512)



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## ABSTRACT

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 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. 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.

## OBJECTIVE OF THE PROJECT

The objective of the recipe recognition 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.







# PROBLEM STATEMENT

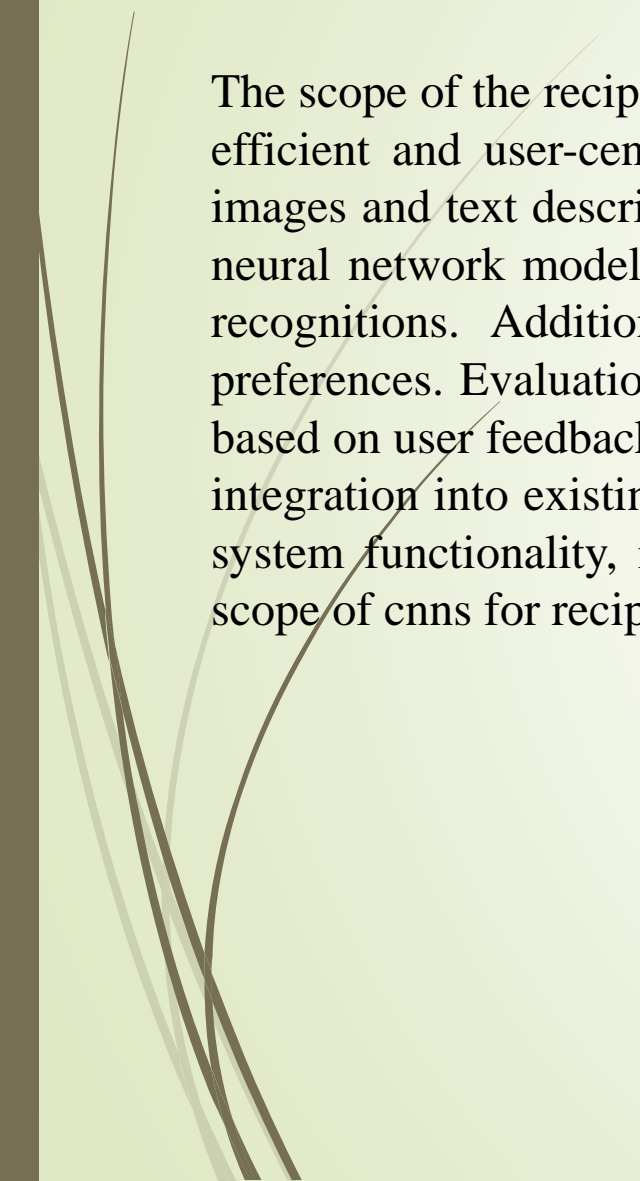
Users frequently encounter difficulties in finding recipes that align with their dietary restrictions and ingredient availability. This highlights the need for an innovative solution that combines advanced technologies with traditional recognition methodologies to provide tailored recipe recognitions.

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



## SCOPE

The scope of the recipe recognition system project encompasses several crucial aspects aimed at developing an efficient and user-centric platform. This includes collecting and preprocessing a diverse dataset of recipe images and text descriptions to ensure data quality. The project involves designing and training convolutional neural network models to extract relevant features from recipe images and text, thereby facilitating accurate recognitions. Additionally, user interface design is pivotal, ensuring intuitive interaction for inputting preferences. Evaluation using standard metrics such as accuracy and precision, alongside iterative refinement based on user feedback, ensures the system's continual improvement. Deployment options, either standalone or integration into existing platforms, guarantee accessibility to a broad user base. While the project emphasizes system functionality, it does not extend to content creation or implementing advanced features beyond the scope of cnns for recipe analysis.





# 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.

## EXISTING METHOD

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.

### **Disadvantages:**

- Manual search or text-based input is required to find recipes.
- Inability to automatically classify recipes directly from images.
- Inaccurate or slow identification due to the absence of modern deep learning models.
- Lack of personalization or advanced filtering based on visual content.



# PROPOSED METHOD

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.

## Advantages:

- **Image-based recipe identification:** users can upload an image, and the system will recognize and classify the recipe.
- **Deep learning for high accuracy:** the cnn model will be trained on a large dataset of dish images to improve recognition accuracy.
- **Scalability:** the system can be expanded to recognize a wide variety of recipes from different cuisines.

# SOFTWARE AND HARDWARE REQUIREMENTS

## SOFTWARE REQUIREMENTS

Operating system	: windows 7/8/10
Server side script	: HTML, CSS, bootstrap & JS
Programming language	: python
Libraries	: flask,pandas, mysql.Connector, os, smtpplib, numpy
IDE/workbench	: pycharm
Technology	: python 3.6+
Server deployment	: xampp server
Database	: mysql

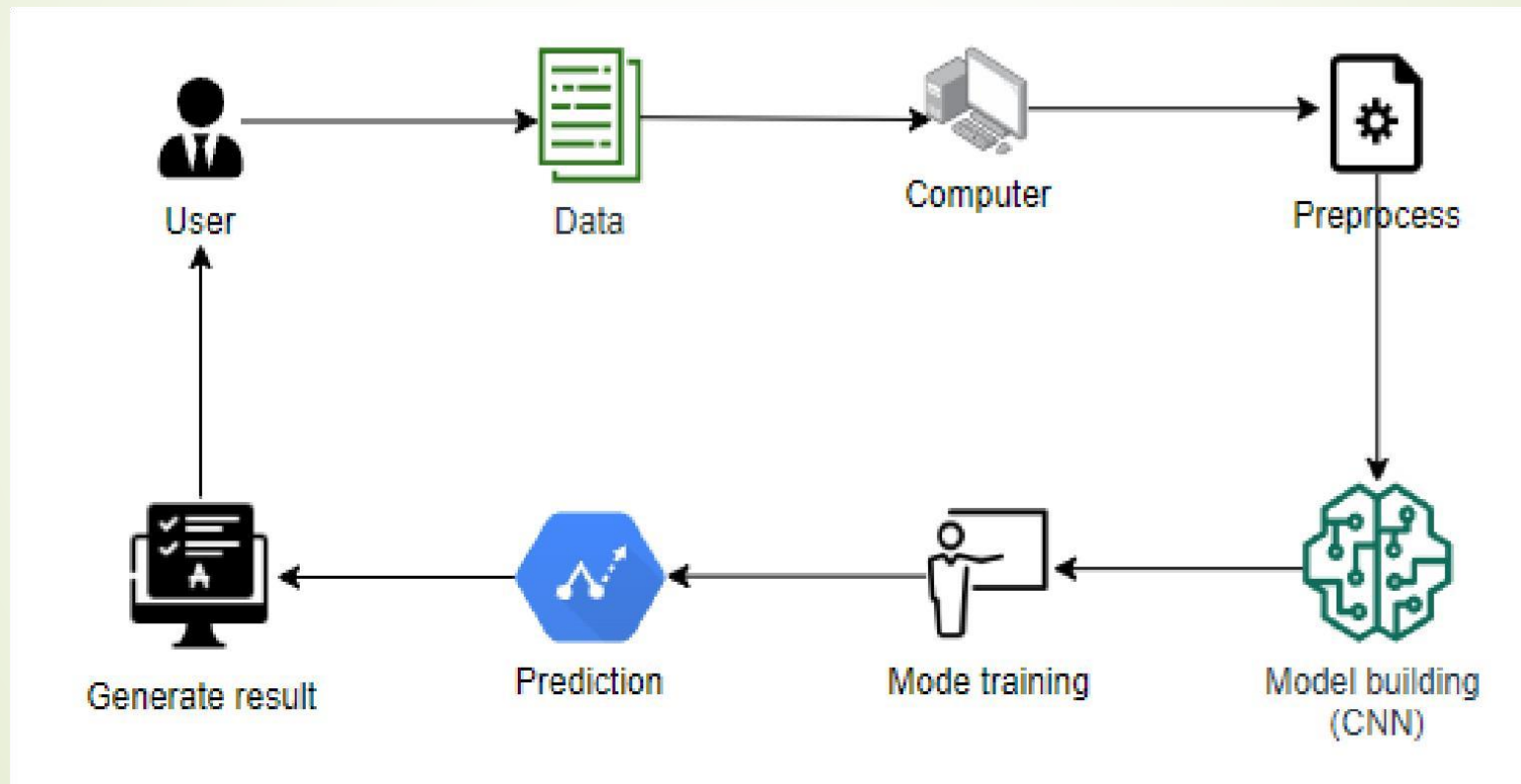


## HARDWARE REQUIREMENTS

Processor	- I3/intel processor
Hard disk	- 160GB
Key board	- standard windows keyboard
Mouse	- two or three button mouse
Monitor	- SVGA
Ram	- 8gb



# ARCHITECTURE





# MODULES

## System:

### 1.1 create dataset:

In this module, the dataset containing images for recipe 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.

**2.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:

**2.1 login :** Admin can login with the default credential.

**2.2 add food details :** He can add food (name, image, ingredients, making procedure, youtube link for making procedure).

And he can also edit and delete those food details.

## 3. User:

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

**3.2 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.

After predicting we will get recipe name.

# 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.

# UML DIAGRAMS

## CLASS DIAGRAM

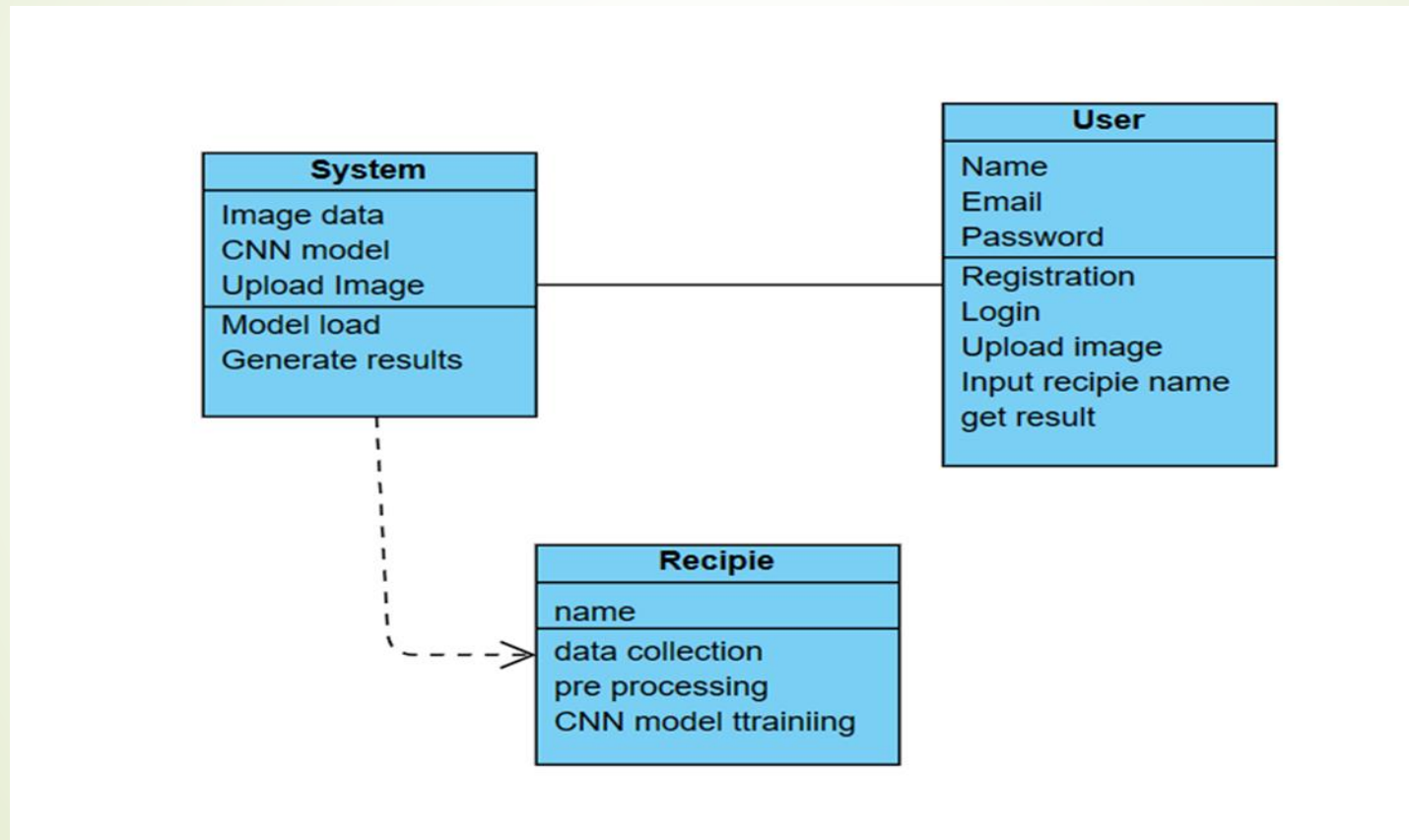
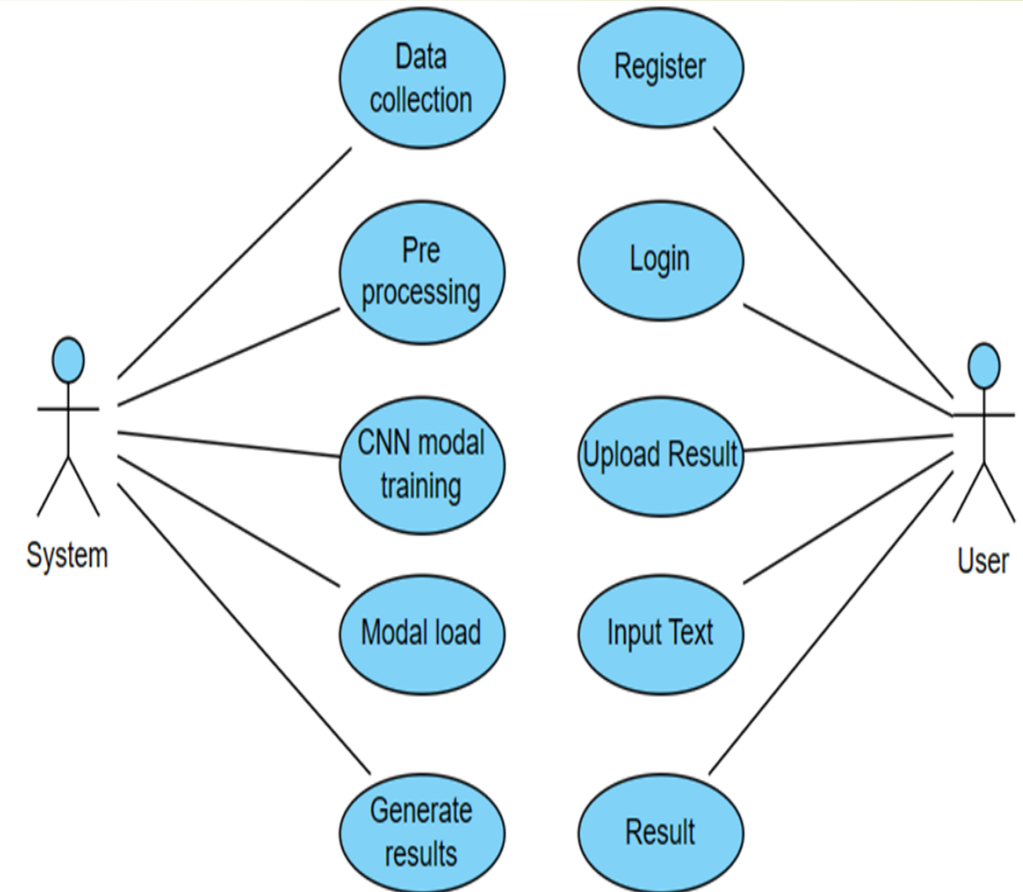


Fig : Class diagram for system and user



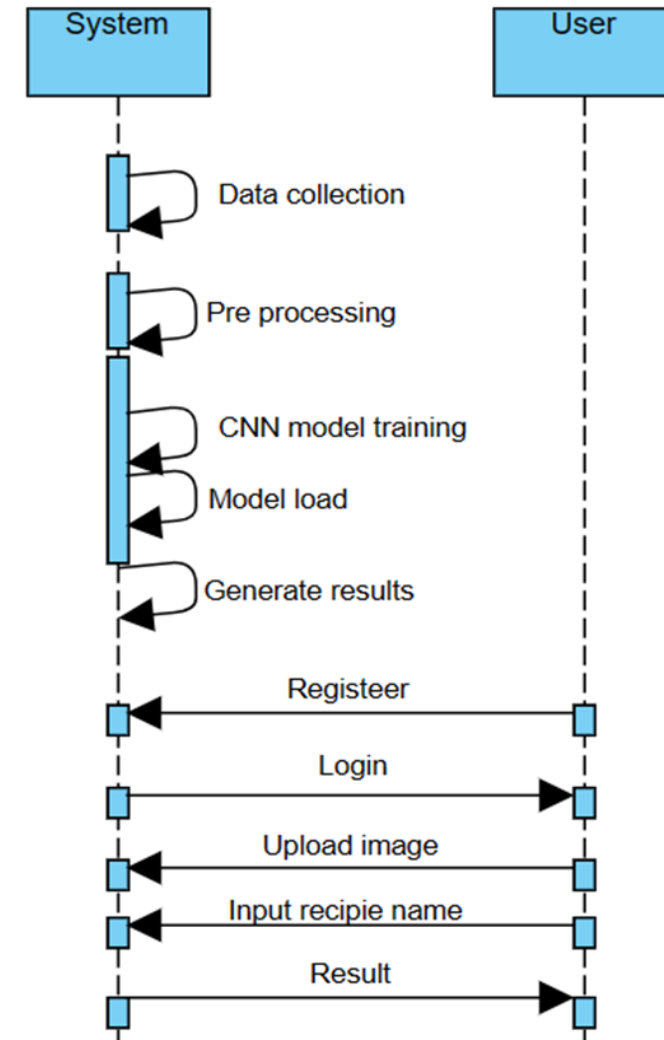
# USECASE DIAGRAM

A usecase diagram in the unified modeling language (UML) is a type of behavioral diagram defined by and created from a use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system. The main purpose of a use case diagram is to show what system functions are performed for which actor. roles of the actors in the system can be depicted.



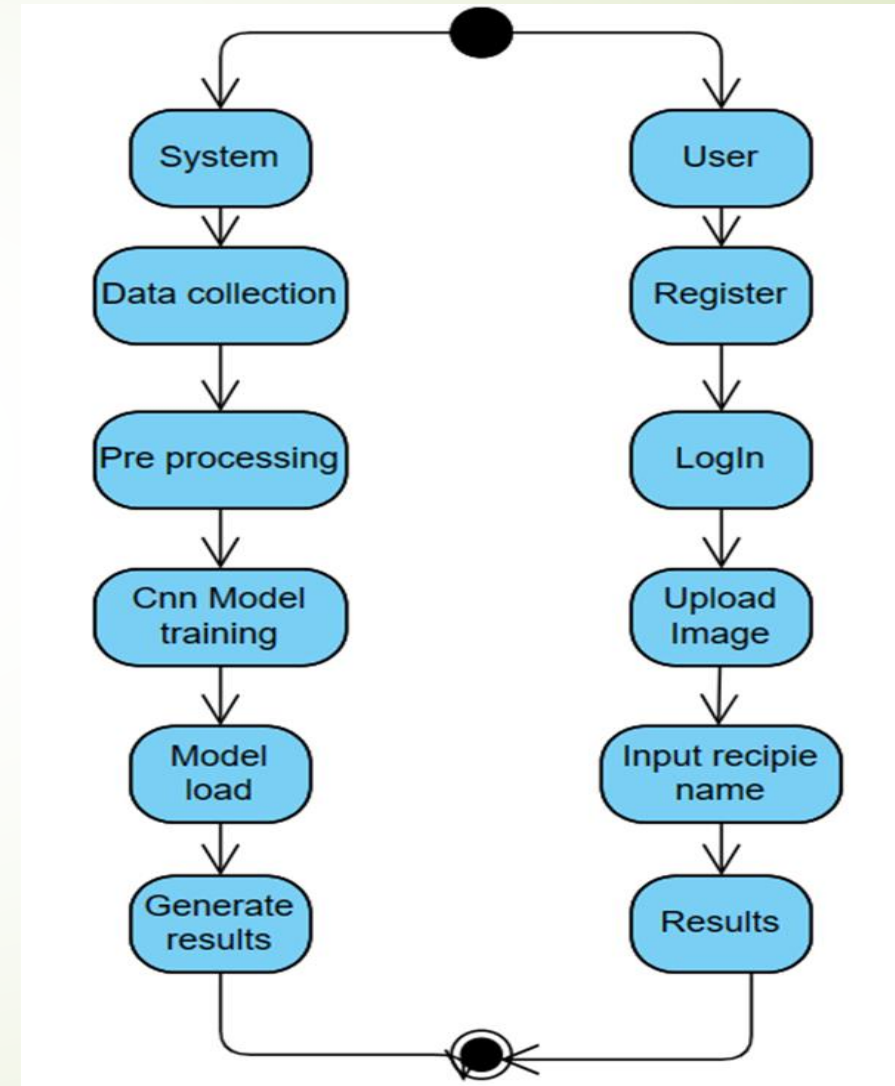
# SEQUENCE DIAGRAM

A sequence diagram in unified modeling language (UML) is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a message sequence chart. Sequence diagrams are sometimes called event diagrams, event scenarios, and timing diagrams

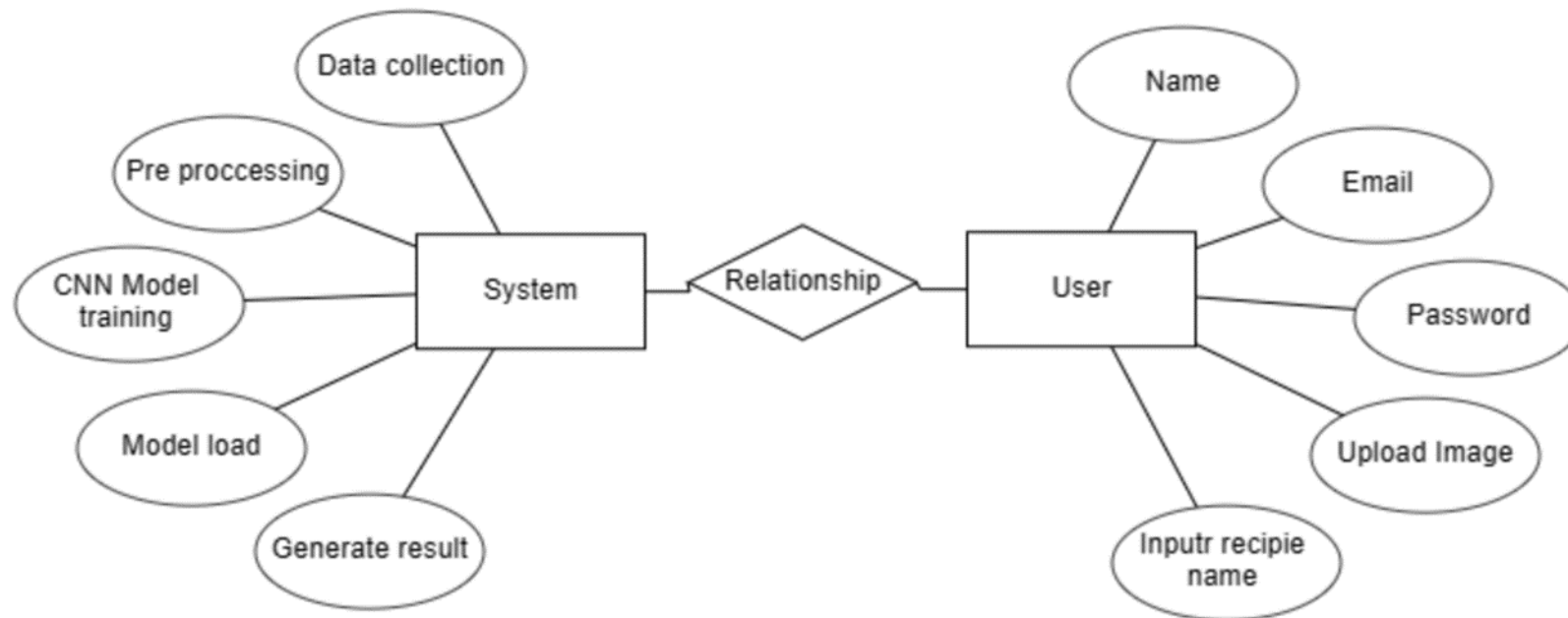


# ACTIVITY DIAGRAM

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the unified modeling language, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system. An activity diagram shows the overall flow of control.



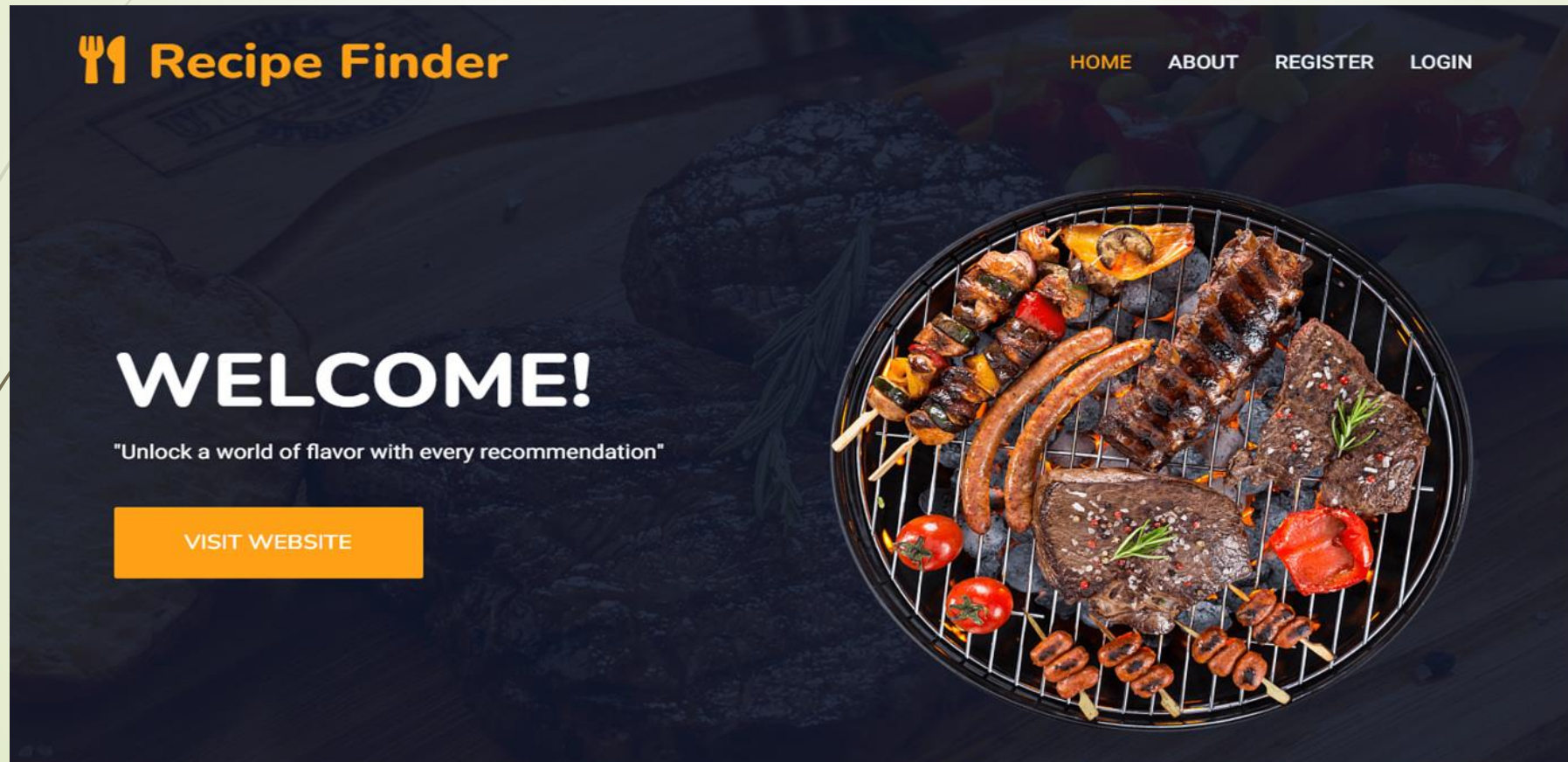
# ER DIAGRAM





# OUTPUT SCREENS

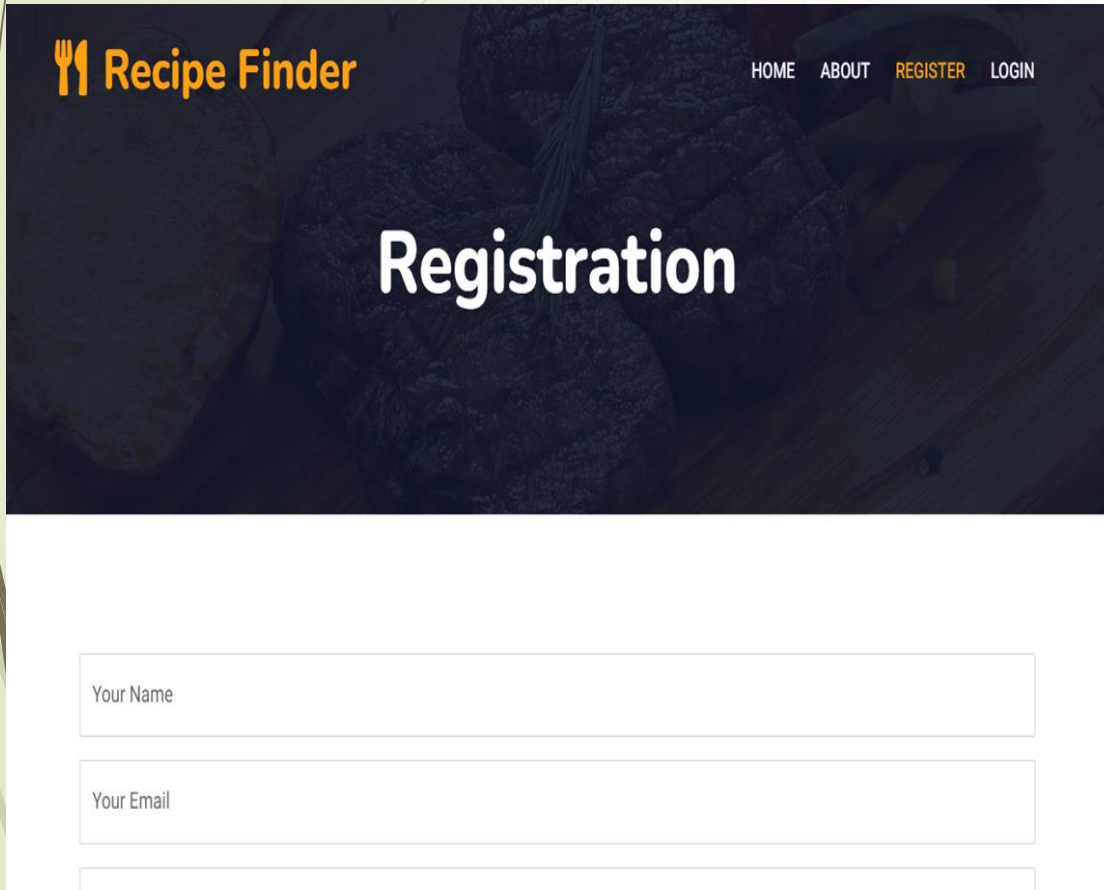
## HOME PAGE



# ABOUT PAGE



# REGISTRATIONS PAGE



A mockup of a registration page for 'Recipe Finder'. The header is dark blue with the logo on the left and navigation links on the right. The main content area has a dark background with the word 'Registration' in large white text. Below this, there are three white input fields for 'Your Name', 'Your Email', and a partially visible third field.

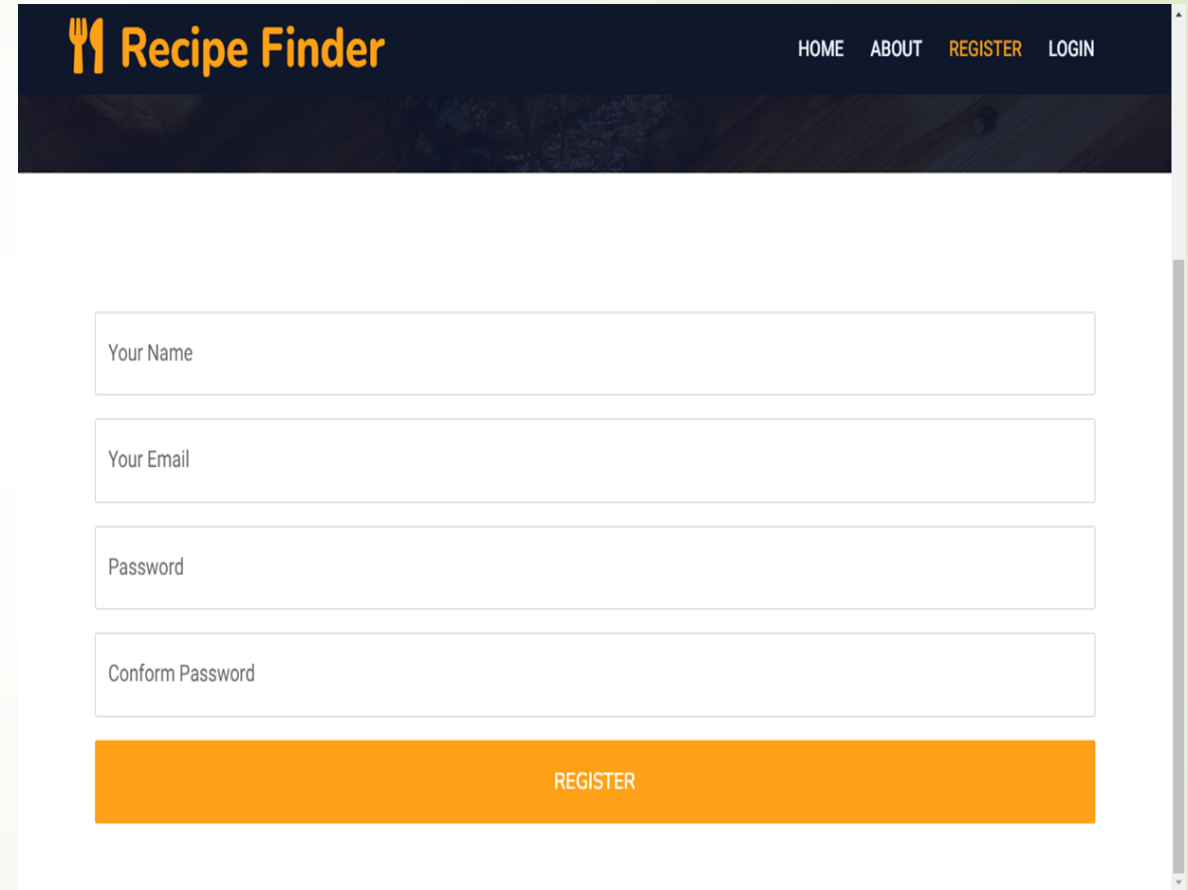
Recipe Finder

HOME ABOUT REGISTER LOGIN

## Registration

Your Name

Your Email



A mockup of a registration page for 'Recipe Finder'. The header is dark blue with the logo on the left and navigation links on the right. The main content area is white and contains four input fields: 'Your Name', 'Your Email', 'Password', and 'Conform Password'. Below these fields is a large orange 'REGISTER' button.

Recipe Finder

HOME ABOUT REGISTER LOGIN

Your Name

Your Email


Password

Conform Password

REGISTER



## LOGIN PAGE

HOME ABOUT REGISTER LOGIN

LogIn


LOGIN

## USER HOME PAGE





## UPLOAD IMAGE AND RESULT PAGES

HOME UPLOAD SEARCH LOGOUT


### Predictions

Name: dhokla

Ingredients: Gram flour, yogurt, turmeric, baking soda, sugar, lemon juice, green chili, mustard seeds, coriander leaves, water.


Making Procedure: Mix gram flour with yogurt and water to make a batter. Add turmeric and let it ferment. Before steaming, add baking soda and pour into a greased pan. Steam until cooked. Temper with mustard seeds, green chili, and add coriander leaves on top.

Video Link: [Click here](#)



Image

## TEXT UPLOAD PAGE

HOME UPLOAD SEARCH LOGOUT


### Predictions

Name: pizza

Ingredients: Pizza dough, tomato sauce, mozzarella cheese, toppings of choice (pepperoni, mushrooms, bell peppers, onions), olive oil, oregano, basil.


Making Procedure: Stretch out the pizza dough on a baking tray. Spread tomato sauce over the base. Sprinkle mozzarella cheese and add toppings of choice. Drizzle with olive oil and sprinkle oregano and basil. Bake in a preheated oven at a high temperature until the crust is golden and cheese is bubbling.

Video Link: [Click here](#)



pizza

## ADD RECIPE PAGE

Recipe Finder

HOMEADDVIEWLOGOUT

Recipe Name

Image

Choose FileNo file chosen

Ingredients

Making Procedure


Video Link

SUBMIT

## VIEW PAGE



# RECIPE MODIFICATION PAGE


Recipe Finder

HOMEADDVIEWLOGOUT

Name

momos


Image



Choose File

No file chosen

Ingredients

Recipe Finder

HOMEADDVIEWLOGOUT

Making Procedure

Mix flour with water and a little oil to form a smooth dough. Mix finely chopped or ground filling with onion, garlic, ginger, soy sauce, and salt. Roll out small circles from the dough, place filling in the center, and pleat to seal. Steam the

Video Link

[View the Link](#)

https://youtu.be/kfvXn1RMRpY?si=daixCgSUaH4kgF8P

UPDATE

DELETE



## CONCLUSION

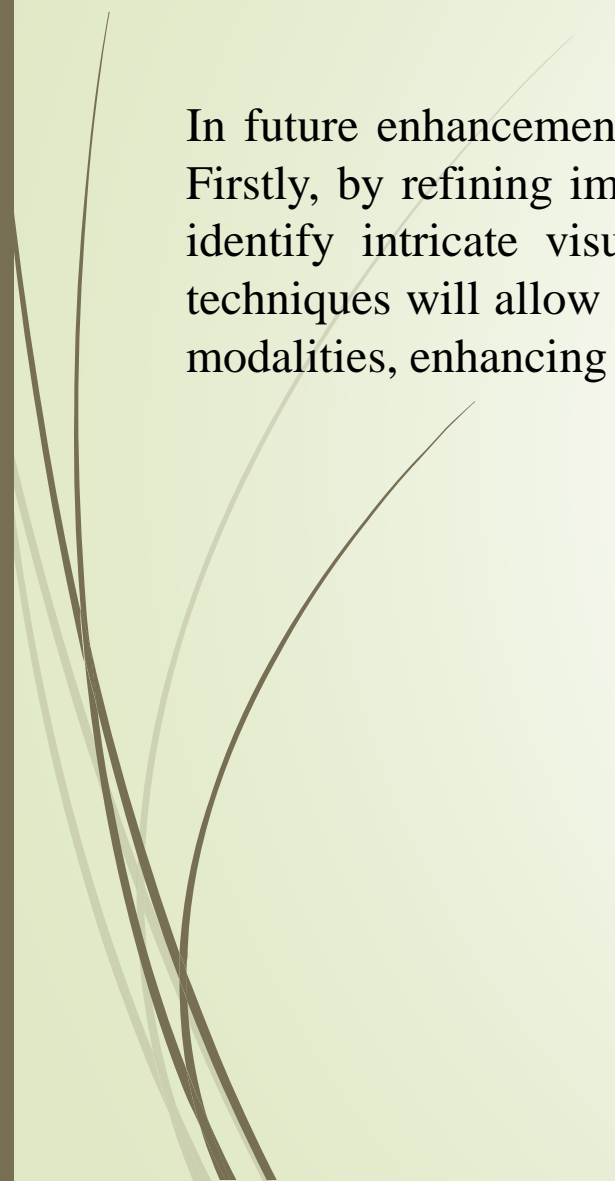
In conclusion, the recipe recognition system represents a significant advancement in the field of culinary exploration and meal planning. By integrating convolutional neural networks (cnns) with traditional recognition methodologies, the system offers a comprehensive and personalized approach to recipe 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. Ultimately, the recipe recognition system aims to inspire culinary exploration, foster creativity in the kitchen, and enrich the overall cooking experience for users worldwide.





## **FUTURE ENHANCEMENT**

In future enhancements, the recipe recognition system aims to advance its capabilities in several key areas. Firstly, by refining image recognition through improved CNN models, the system will be better equipped to identify intricate visual patterns within recipe images. Moreover, the integration of multi-modal fusion techniques will allow for a more comprehensive analysis by combining information from both image and text modalities, enhancing recognition accuracy.



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*Thank  
you!*