



Mini Project Report On

Food Shazam

*Submitted in partial fulfillment of the requirements for the
award of the degree of*

Bachelor of Technology

in

Computer Science & Engineering

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CERTIFICATE

*This is to certify that the mini project report entitled "**Food Shazam**" is a bonafide record of the work done by , **ABHISHEK P.S (U2103009)**, **AKSHAY M.S (U2103019)**, **ALBIN JOHN JOHNY (U2103022)**,**AMITH KRISHNAN P.M (U2103033)** submitted to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology (B. Tech.) in Computer Science and Engineering during the academic year 2023-2024.*

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Abstract

Maintaining a healthy diet is an important goal for many people. Most of the people have a curiosity about the food they are consuming and the ingredients that constitute the food. When visiting a new unknown place, it would be difficult for a person to identify the different types of local foods and whether the food would be suitable for them. Food Shazam is a website that is aimed at solving these issues. It aims at identifying different Indian cuisines using its image. Based on the type of food predicted, it would then list out the general ingredients that were used in the preparation of the corresponding food item and thereby ensuring the user whether the food is suitable for them or not. It also helps in dictating the nutritional contents like calories, sugar, fat,etc.... which is essential information in this era of diet consciousness. It then predicts that whether the food is healthy or unhealthy. It also lists the veg and non-veg options for food. It incorporates all of the above features with a user friendly UI which is easy to use and inclusive to all. Overall the website aims at identifying the food and provide the user with its details all based on the image provided.

Contents

Acknowledgements	i
Abstract	ii
List of Figures	vi
1 Introduction	1
1.1 Background	1
1.2 Problem Definition	1
1.3 Scope and Motivation	1
1.4 Objectives	2
1.5 Challenges	2
1.6 Assumptions	2
1.7 Societal / Industrial Relevance	3
1.8 Organization of the Report	3
2 Software Requirements Specification	4
2.1 Introduction	4
2.1.1 Purpose	4
2.1.2 Product scope	4
2.2 Overall Description	4
2.2.1 Product Perspective	4
2.2.2 Product Functions	5
2.2.3 Operating Environment	5
2.2.4 Design and Implementation Constraints	5
2.2.5 Assumptions and Dependencies	5
2.3 External Interface Requirements	6
2.3.1 User Interfaces	6
2.3.2 Hardware Interfaces	6

2.3.3	Software Interfaces	7
2.3.4	Communications Interfaces	7
2.4	System Features	7
2.4.1	Food Identification	7
2.4.2	Nutritional Information Retrieval	8
2.4.3	Ingredient Identification	9
2.5	Other Nonfunctional Requirements	9
2.5.1	Performance Requirements	9
2.5.2	Software Quality Attributes	10
3	System Architecture and Design	11
3.1	System Overview	11
3.2	Architectural Design	12
3.3	Dataset identified	13
3.4	Proposed Methodology/Algorithms	13
3.5	User Interface Design	14
3.6	Database Design	15
3.7	Description of Implementation Strategies	16
3.8	Module Division	16
3.9	Work Schedule - Gantt Chart	17
4	Results and Discussions	18
4.1	Overview	18
4.2	Testing	18
4.3	Quantitative Results	21
4.4	Graphical Analysis	22
4.5	Discussion	22
5	Conclusion	24
5.1	Conclusion	24
5.2	Future Scope	24
References		26

Appendix A: Presentation	27
Appendix B: Vision, Mission, Programme Outcomes and Course Outcomes	42
Vision, Mission, POs, PSOs and COs	ii
Appendix C: CO-PO-PSO Mapping	vi

List of Figures

3.1	System Architecture	11
3.2	Sequence Diagram	12
3.3	Use Case Diagram	12
3.4	ER Diagram	13
3.5	Home Page	14
3.6	Service Page	14
3.7	About Page	14
3.8	Sequence Diagram	17
4.1	Home Page	18
4.2	Uploading image of food to be identified	19
4.3	Predicted Food Item	19
4.4	Nutritional Information and basic Ingredients list	20
4.5	Confusion Matrix	21
4.6	Accuracy Graph	22

Chapter 1

Introduction

1.1 Background

It can be quite overwhelming for travelers in India to try and differentiate between the various dishes available to them. Additionally, in today's health-conscious world, people are increasingly interested in knowing exactly what they're consuming and what nutritional value it provides. Hence our project is focused on using image recognition technology to identify Indian food and provide a detailed list of ingredients as well as nutritional content. By doing so, we hope to make it easier for people to make informed decisions about what they eat while enjoying the rich and diverse cuisine of India.

1.2 Problem Definition

To design and develop a website that integrates AI Model for food identification, listing its main ingredients and its nutritional information aimed at users who are new to the Indian food culture.

1.3 Scope and Motivation

The project has been designed to provide a helpful resource to those who are new to India and are unfamiliar with the diverse range of food options available.

The project aims to assist individuals in identifying various types of food, including regional and traditional dishes, along with providing relevant information such as calorie intake and common ingredients used in their preparation. This comprehensive database of food information can be particularly beneficial to those who are health-conscious or have specific dietary requirements. By providing accurate and detailed information, the

project aims to help individuals make informed decisions about their food choices while exploring the vibrant culinary culture of India.

1.4 Objectives

- Identify the Indian cuisine from its image.
- Provide the user with an approximate amount of calories in the identified food.
- Provide the user with the general ingredients used in the preparation of the food item.
- Determine whether the food is healthy or unhealthy based on its nutritional contents.

1.5 Challenges

The development of Food Shazam presents several significant challenges, including the complexity of accurately identifying and cataloging a vast array of food items across different cuisines and dietary preferences. Additionally, ensuring the reliability and accuracy of nutritional information and ingredient data poses a considerable challenge, requiring robust data sources and continuous updates to maintain relevance and usefulness for users. Furthermore, integrating seamless user experience while handling real-time image recognition and data processing in a web application environment presents technical hurdles that require careful consideration and optimization.

1.6 Assumptions

The assumptions of this project are:

- Users provide clear and relevant images of food items for accurate identification.
- Users find value in the features offered by the application and actively use it.
- Users have a stable internet connection and a compatible browser to access the platform.

1.7 Societal / Industrial Relevance

Food Shazam provides users with a seamless experience in identifying the various Indian Food items that they come across. It provides the users with a way to identify the food item along with its nutritional contents. It benefits all those adhering to a strict diet plan by providing them with the calorie details of the food ensuring the right amount of calorie intake.

1.8 Organization of the Report

The contents of the Project Report are organized as follows:

Chapter 2 consists of the Software Requirements Specifications(SRS) document of the project. It includes topics such as Purpose, Overall Description, External Interface Requirements, System Features, and other Non-Functional Requirements.

Chapter 3 consists of the System Architecture and Design document of the project. It includes topics such as System Overview, Architectural Design, Identified Dataset, Proposed Methodology/Algorithms, User Interface Design, Database Design, Implementation Strategies, Module Division, and Gantt Chart.

Chapter 2

Software Requirements Specification

2.1 Introduction

2.1.1 Purpose

People traveling through India find it difficult to recognize the wide variety of dishes. Also in this generation where everyone is health conscious, what they consume and what it contains is important. Our project aims to solve this issue by identifying Indian food from its image and listing its ingredients and nutritional contents such as carbohydrates, fat, protein, and sugar content.

2.1.2 Product scope

The project benefits all those who are new to India in identifying the different types of food provides information such as calorie intake and common ingredients.

2.2 Overall Description

2.2.1 Product Perspective

The Food Shazam platform is envisioned as a standalone application aimed at providing users with a convenient tool for identifying food items through images and accessing their nutritional information. It is designed to be a new, self-contained product that fulfills a specific need in the market for accurate and accessible food identification and nutritional analysis. The application will interface with external databases or APIs to retrieve nutritional information and may require integration with image processing libraries for accurate identification.

2.2.2 Product Functions

- Food Identification: Identify the Indian cuisine from its image
- Nutritional Information: Provide the user with an approximate amount of calories in the identified food.
- Listing Ingredients: Provide the user with the general ingredients used in the preparation of the food item.
- Healthy/Unhealthy Indicator: Determine whether the food is healthy or unhealthy based on its nutritional contents.

2.2.3 Operating Environment

The operating environments used by this website are:

- Front End- HTML, CSS
- Backend- Python, Flask, ML Model
- OS- Supported by most OS
- Browser- Compatible by most browsers

2.2.4 Design and Implementation Constraints

Food Shazam is designed under the following constraints:

- Quality of Image: The images uploaded must be of good quality which ensures accurate identification of the food.
- Ingredient Database Quality: The system relies on a comprehensive database of food ingredients and their nutritional information

2.2.5 Assumptions and Dependencies

The assumptions of this project are:

- Users provide clear and relevant images of food items for accurate identification.

- Users find value in the features offered by the application and actively use it.
- Users have a stable internet connection and compatible browser to access the platform.

The various dependencies of this project are:

- The platform needs to be compatible with various platforms such as iOS, Android, and web browsers.
- The development of the image recognition module depends on the availability and integration of machine learning libraries such as TensorFlow or PyTorch.
- The project depends on having a suitable development environment with necessary software tools and libraries installed for development and deployment.

2.3 External Interface Requirements

2.3.1 User Interfaces

Food Shazam's user interface makes use of simple coloring schemes and fonts to make it simple and easy for the users to understand the contents. Users can upload images from their system into the platform for the images to be identified. The calorie and nutritional information are displayed in a table format which makes it easier for the user in reading the content.

2.3.2 Hardware Interfaces

Food Shazam is compatible with a range of hardware devices including smartphones, tablets, and computers. It supports common operating systems such as iOS, Android, and Windows and can be accessed with the help of modern-day browsers such as Chrome, Firefox, Opera. The platform will interface with the device's camera for capturing images of food items. It also seamlessly adapts to different screen sizes and resolutions to ensure a consistent user experience across devices

2.3.3 Software Interfaces

Food Shazam makes use of multiple software platforms and packages to implement and deliver its functionality. It uses MySQL for database management. Tensorflow(v2.16.1) and Keras(v3.0.5) packages are used in this product which facilitate the ML model architecture and training. Flask(v3.0.2) is a web framework for Python that helps in handling HTTP requests (form data). This helps in providing the user input to the ML model for identification. The data items that come into the system are of image type. This input is provided to the ML model to identify the particular food item and then sends the identified food item along with the calorie information, ingredients as output.

2.3.4 Communications Interfaces

Food Shazam makes use of HTTP protocols over the internet to communicate with the users. When a user uploads an image and submits it through the web interface, the web browser initiates an HTTP POST request to the server. The server, equipped with an endpoint specifically designed for handling such POST requests, receives the input image and forwards it to the Machine Learning model for processing.

2.4 System Features

2.4.1 Food Identification

Description and Priority

This feature enables users to identify food items by uploading images.

Priority: It is of High priority as it forms the core functionality of the application.

Stimulus/Response Sequences

Stimulus: User uploads an image of a food item.

Response: System processes the image using image recognition algorithms and identifies the food item in the image.

Functional Requirements

- REQ-1: The system shall provide an option for users to upload images from their device's camera or gallery.
- REQ-2: The system shall utilize machine learning algorithms for image processing and food identification.
- REQ-3: The system shall accurately identify the food item depicted in the uploaded image with a confidence level of at least 90
- REQ-4: If the system cannot confidently identify the food item, it shall display a message indicating uncertainty and provide suggestions for further action (e.g., manual input or refining the image).
- REQ-5: The system shall continuously update its image recognition model to improve accuracy and support new food items.

2.4.2 Nutritional Information Retrieval

Description and Priority

This feature allows users to retrieve nutritional information for identified food items.

Priority: It is of High priority as it provides essential information for users' dietary decisions.

Stimulus/Response Sequences

Stimulus: System retrieves nutritional information for the selected food item from an external database.

Response: System displays the nutritional values to the user.

Functional Requirements

- REQ-1: The system shall retrieve nutritional information for identified food items from a reliable external database or API.
- REQ-2: The system shall display nutritional values such as protein, carbohydrates, fat, sugar content, and calories for the selected food item.

- REQ-3: The system shall provide nutritional values per serving size or per 100 grams, allowing users to adjust portion sizes.
- REQ-4: If nutritional information is not available for a specific food item, the system shall display a message indicating unavailability and suggest alternative sources for obtaining nutritional data.

2.4.3 Ingredient Identification

Description and Priority

This feature provides users with a list of basic ingredients present in the identified food item.

Priority: It is of Medium priority as it enhances the user's understanding of the food composition.

Stimulus/Response Sequences

Stimulus: System retrieves a list of ingredients for the selected food item.

Response: System displays the list of ingredients to the user.

Functional Requirements

- REQ-1: The system shall retrieve a list of basic ingredients for identified food items from a reliable external database or API.
- REQ-2: The system shall display the list of ingredients to the user in a clear and readable format.
- REQ-3: The system shall continuously update its ingredient database to include new food items and their ingredients.

2.5 Other Nonfunctional Requirements

2.5.1 Performance Requirements

- Responsiveness- The system should be responsive to user requests and smooth in operation.

- Response Time- There should be minimum delay in processing the image and delivering the result to the user.

2.5.2 Software Quality Attributes

- Usability: The application should have a high level of usability, with intuitive user interfaces and smooth navigation. This can be measured by conducting user satisfaction surveys and tracking the time taken to perform common tasks.
- Reliability: The application should be reliable, providing accurate food identification and nutritional information consistently. Reliability can be assessed by tracking the frequency of errors and crashes during usage.
- Accuracy: The accuracy of food identification and nutritional information retrieval is crucial. This can be measured by comparing the results obtained by the application with known nutritional data sources and evaluating the percentage of correct identifications.
- Robustness: The application should be robust, able to handle unexpected inputs and scenarios gracefully. Robustness can be evaluated by observing how the application responds to varying conditions.
- Scalability: The application should be capable of handling a growing user base and increasing amounts of data without significant degradation in performance.

Chapter 3

System Architecture and Design

3.1 System Overview

Food Shazam is an innovative web application designed to revolutionize the way users discover, explore, and enjoy various cuisines. With an intuitive interface and powerful algorithms, Food Shazam aims to provide ingredients and nutritional information of the food provided by the user. By leveraging advanced machine learning techniques and data analytics, Food Shazam offers a seamless and delightful culinary experience for food enthusiasts all over India.

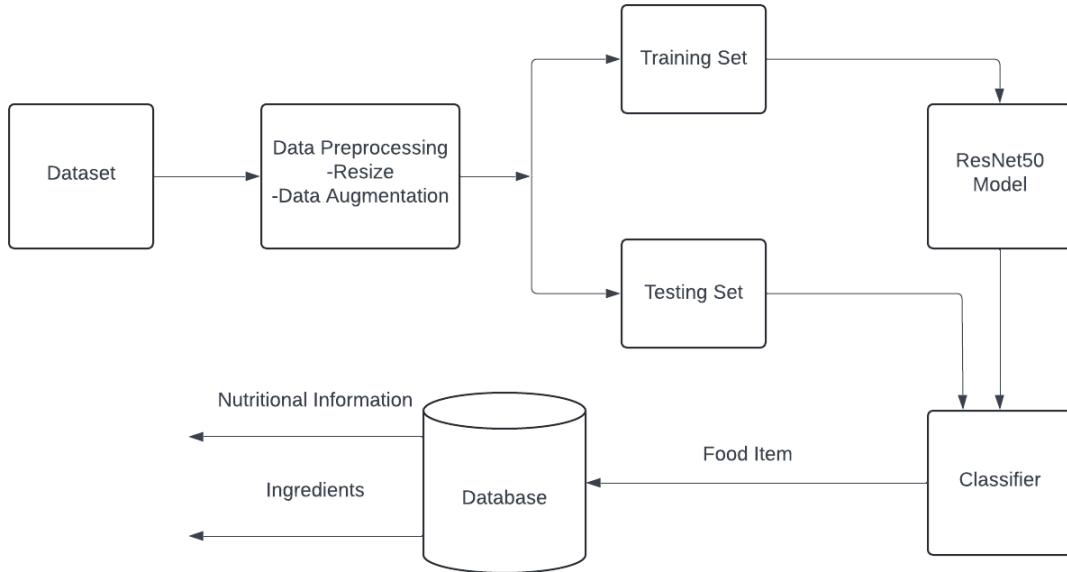


Figure 3.1: System Architecture

3.2 Architectural Design

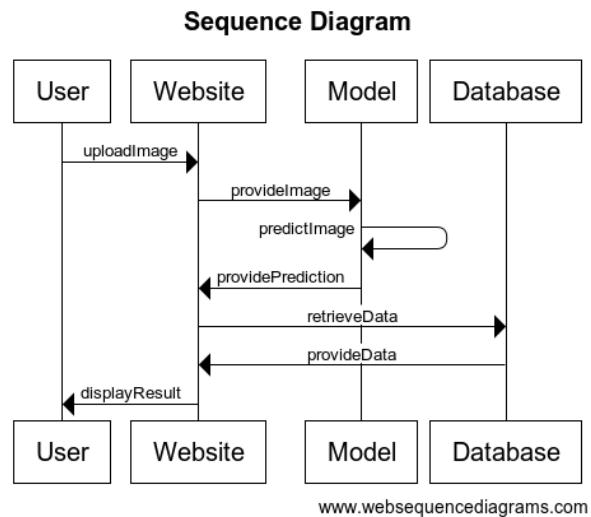


Figure 3.2: Sequence Diagram

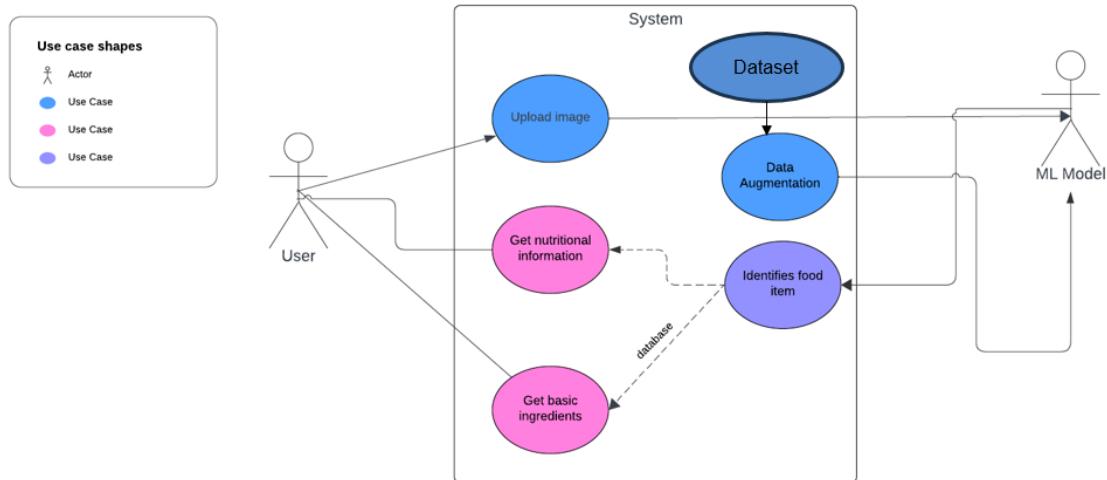


Figure 3.3: Use Case Diagram

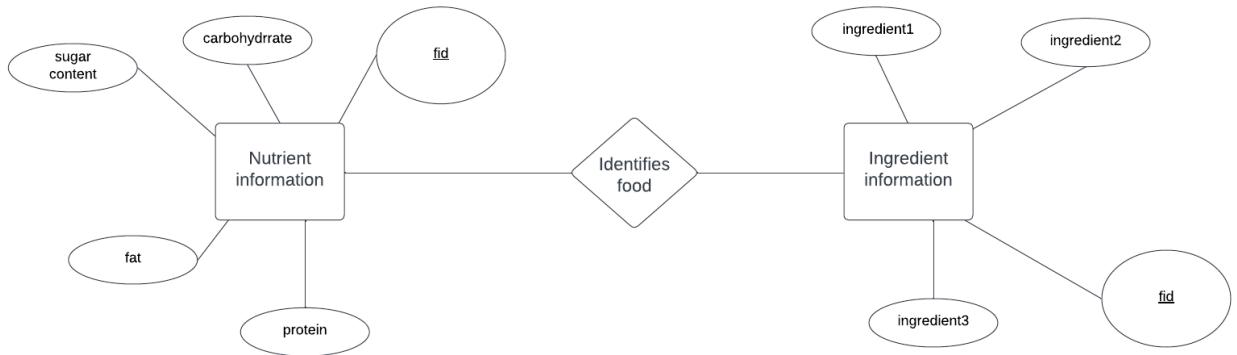


Figure 3.4: ER Diagram

3.3 Dataset identified

The project utilizes the Indian Food Cuisine dataset acquired from Kaggle, which comprises over 20 distinct Indian dishes. Each dish in the dataset contains approximately 500 images, and the images of a particular dish are stored in a folder named after the dish.

3.4 Proposed Methodology/Algorithms

The project makes use of CNN algorithm namely ResNet due to its high accuracy rate. ResNet (short for “Residual Neural Network”) is a family of deep convolutional neural networks designed to overcome the problem of vanishing gradients that are common in very deep networks. The idea behind ResNet is to use “residual blocks” that allow for the direct propagation of gradients through the network, enabling the training of very deep networks.

A residual block consists of two or more convolutional layers followed by an activation function, combined with a shortcut connection that bypasses the convolutional layers and adds the original input directly to the output of the convolutional layers after the activation function. This allows the network to learn residual functions that represent the difference between the convolutional layers’ input and output, rather than trying to learn the entire mapping directly. The use of residual blocks enables the training of very deep networks, with hundreds or thousands of layers, significantly alleviating the issue of vanishing gradients.

3.5 User Interface Design



Figure 3.5: Home Page

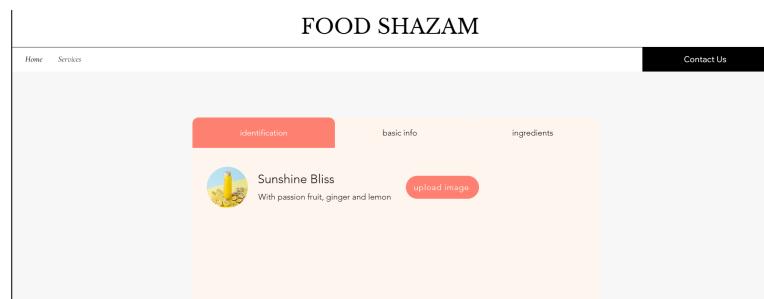


Figure 3.6: Service Page

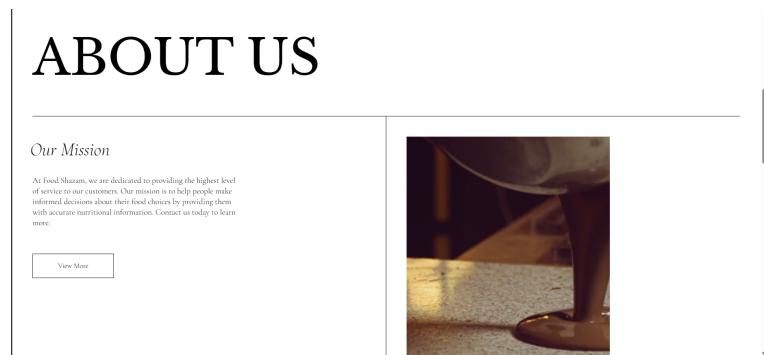


Figure 3.7: About Page

3.6 Database Design

1. Nutrient Columns:

- FID
- Calorie
- Carbohydrate
- Fat
- Sugar Content
- Protein

Constraints: Primary Key: FID

2. Ingredient

Columns:

- FID
- Ingredient 1
- Ingredient 2
- Ingredient 3

Constraints: Primary Key: FID

Database: MySQL

MySQL is a popular open-source relational database management system (RDBMS) that is well-suited for this application for several reasons:

- Free and Open-Source: MySQL is freely available and has a large, active community of developers. This makes it a cost-effective choice and ensures that there are plenty of resources available for troubleshooting and support.
- Ease of Use: MySQL is known for its ease of use and administration. This makes it a good choice for this project, as it is likely to be used by people with varying levels of database expertise.

- Scalability: MySQL can be scaled to accommodate a growing database of ingredients and nutrients. This is important, as the database may need to store information about a large number of ingredients over time.
- Performance: MySQL is known for its good performance, which is important for a database that will be queried frequently to retrieve information about ingredients and their nutrients.

3.7 Description of Implementation Strategies

The project leverages the power of Convolutional Neural Networks (CNNs) to identify food items in images. TensorFlow and Keras libraries provide the foundation for constructing and training the CNN model. They offer tools for defining the network architecture, performing calculations, and optimizing the model's performance. NumPy and Matplotlib libraries act as the workhorses for data manipulation and visualization. NumPy efficiently stores and manages the image data, while Matplotlib allows for creating visual representations of the images and the model's outputs. ImageDataGenerator is particularly useful for a technique called image augmentation. Image augmentation involves creating variations of existing images (like flipping, rotating, or adding noise) to artificially expand the training dataset. This helps the CNN model become more robust and less prone to overfitting on the specific training data used. The project takes advantage of a pre-trained model called ResNet50, available within the Keras applications library. This model has already been trained on a massive dataset of images and categories (like ImageNet), allowing it to recognize a broad range of visual features. By using this pre-trained model as a starting point, the project can leverage this pre-existing knowledge and fine-tune it specifically for the task of food image identification. While the pre-trained ResNet50 model provides a strong foundation, the project adds new layers on top of it. These custom layers are designed to take the output from ResNet50 and translate it into the specific task of predicting the food item present in the image.

3.8 Module Division

1. Image Recognition and ML Model: This module integrates image recognition technology to identify the Indian dish from images uploaded by users with the help of Machine

Learning. It extracts relevant information from the images to facilitate dish recognition.

Assigned to: Abhishek and Albin

2. User Interface Design and Development: This module focuses on designing and developing the user interface for the Food Shazam website. It ensures a seamless and intuitive user experience across different platforms with the help of HTML/CSS.

Assigned to: Abhishek and Amith

3. Database Management: This module involves the development of the database infrastructure for the website, which is used to store ingredients and nutritional information.

Assigned to: Akshay and Amith

4. Testing: This module is responsible for testing the functionality, performance, and accuracy of the Food Shazam website.

Assigned to: Akshay and Albin

3.9 Work Schedule - Gantt Chart

Outline the work schedule in the appropriate chart format.



Figure 3.8: Sequence Diagram

Chapter 4

Results and Discussions

4.1 Overview

Food Shazam has demonstrated remarkable success in its core functionality of identifying food items and retrieving nutritional information. Upon uploading an image of the food, the application swiftly retrieves essential details such as carbohydrates, protein, fat, calories, sugar content, and basic ingredients from its extensive database. The system's accuracy in extracting this information has been consistently high, ensuring users can access reliable nutritional data for informed dietary choices.

4.2 Testing

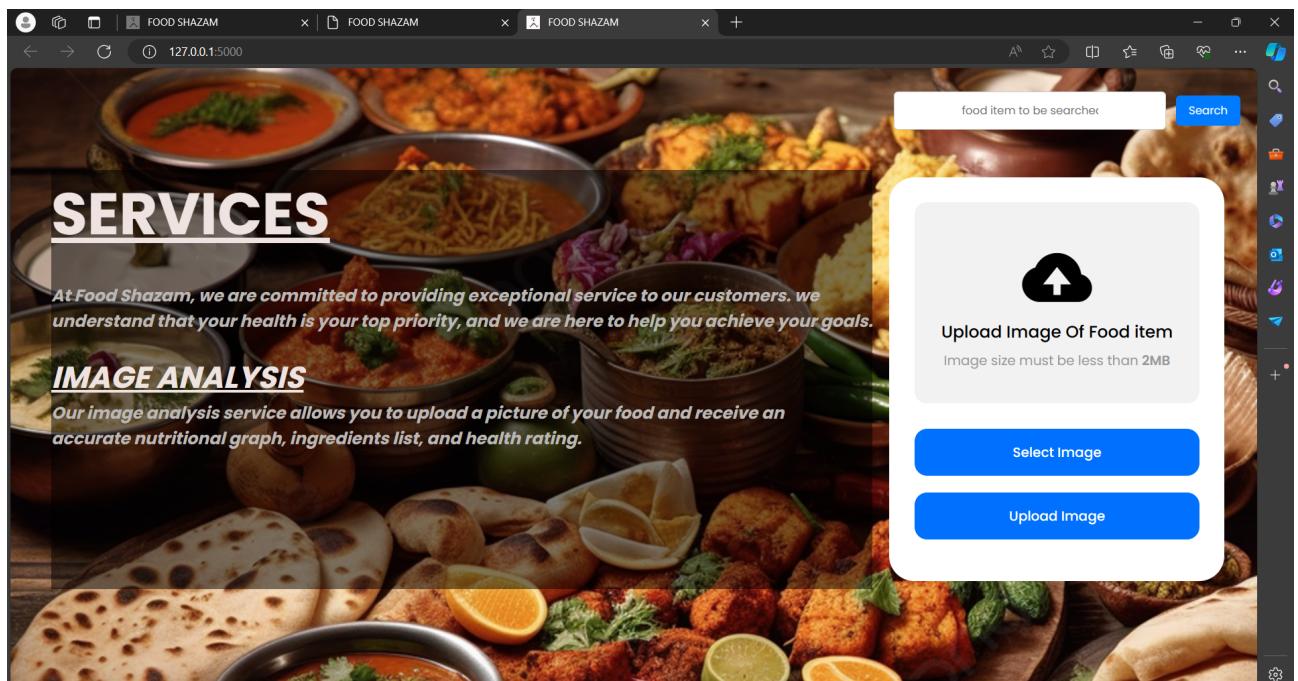


Figure 4.1: Home Page

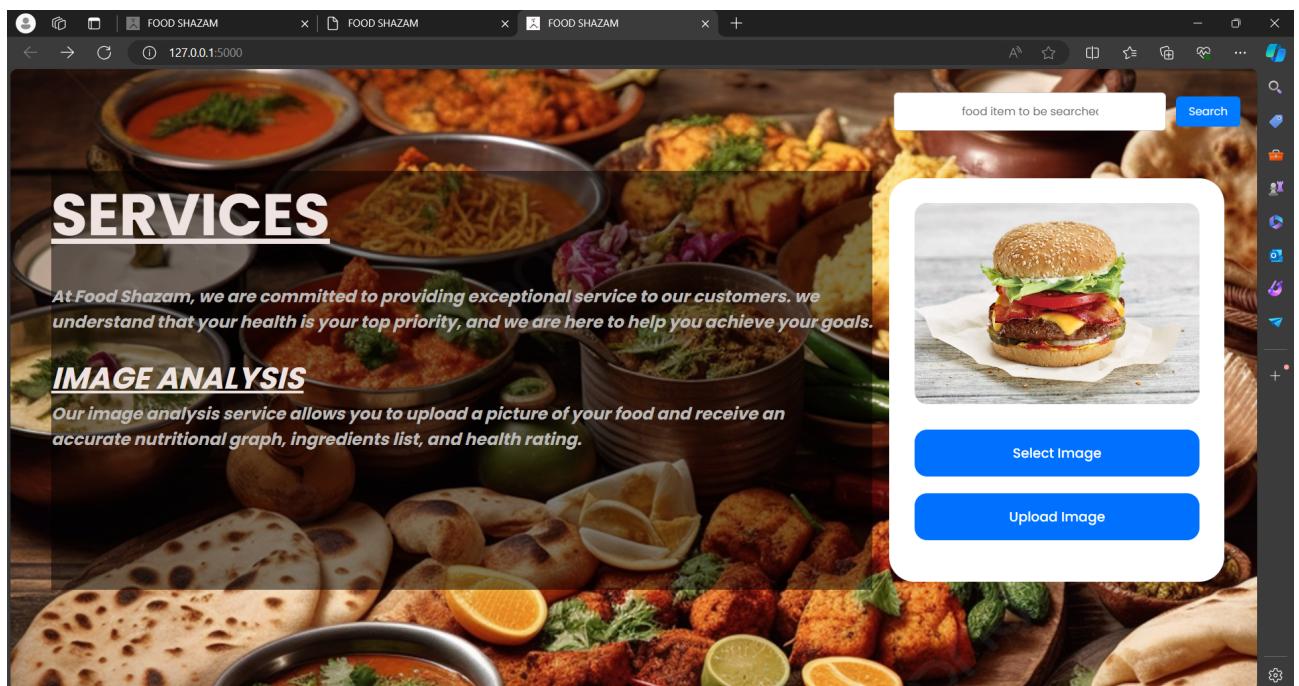


Figure 4.2: Uploading image of food to be identified

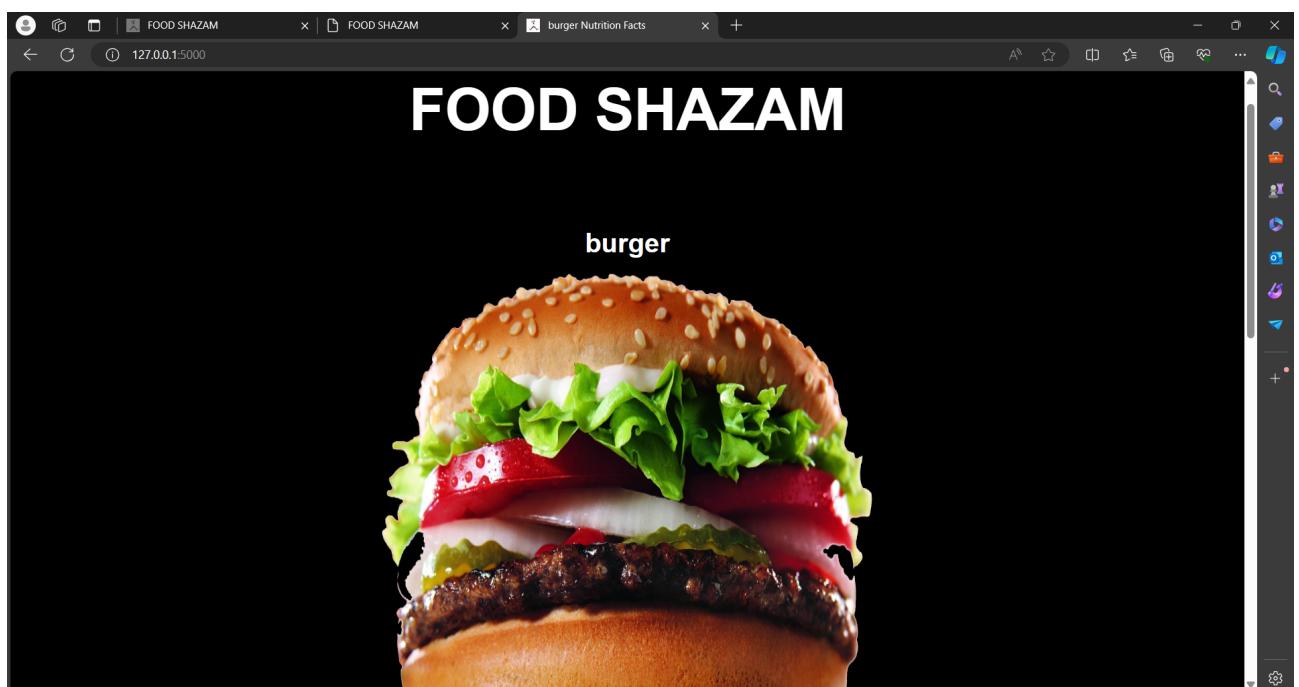


Figure 4.3: Predicted Food Item

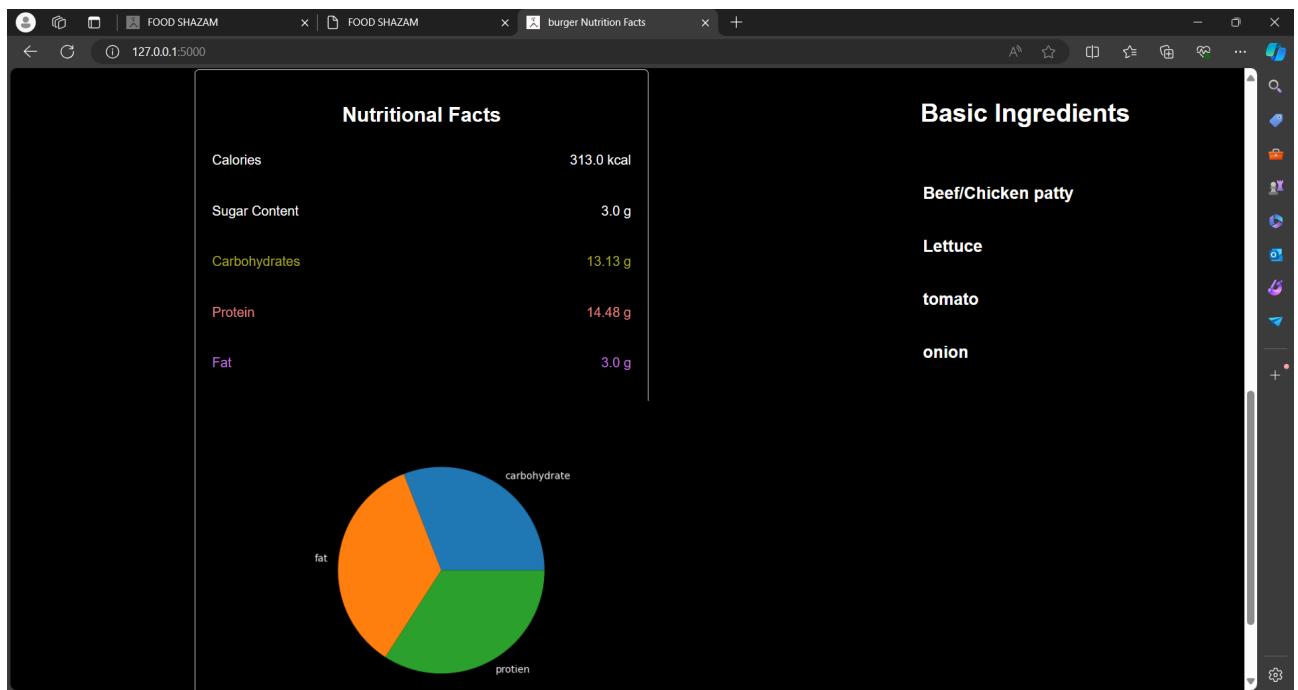


Figure 4.4: Nutritional Information and basic Ingredients list

4.3 Quantitative Results

The model obtained an accuracy of 81.1 on the training data and 82.2 on the test data. The Confusion Matrix consists of the x-axis and the y-axis each containing 20 labels

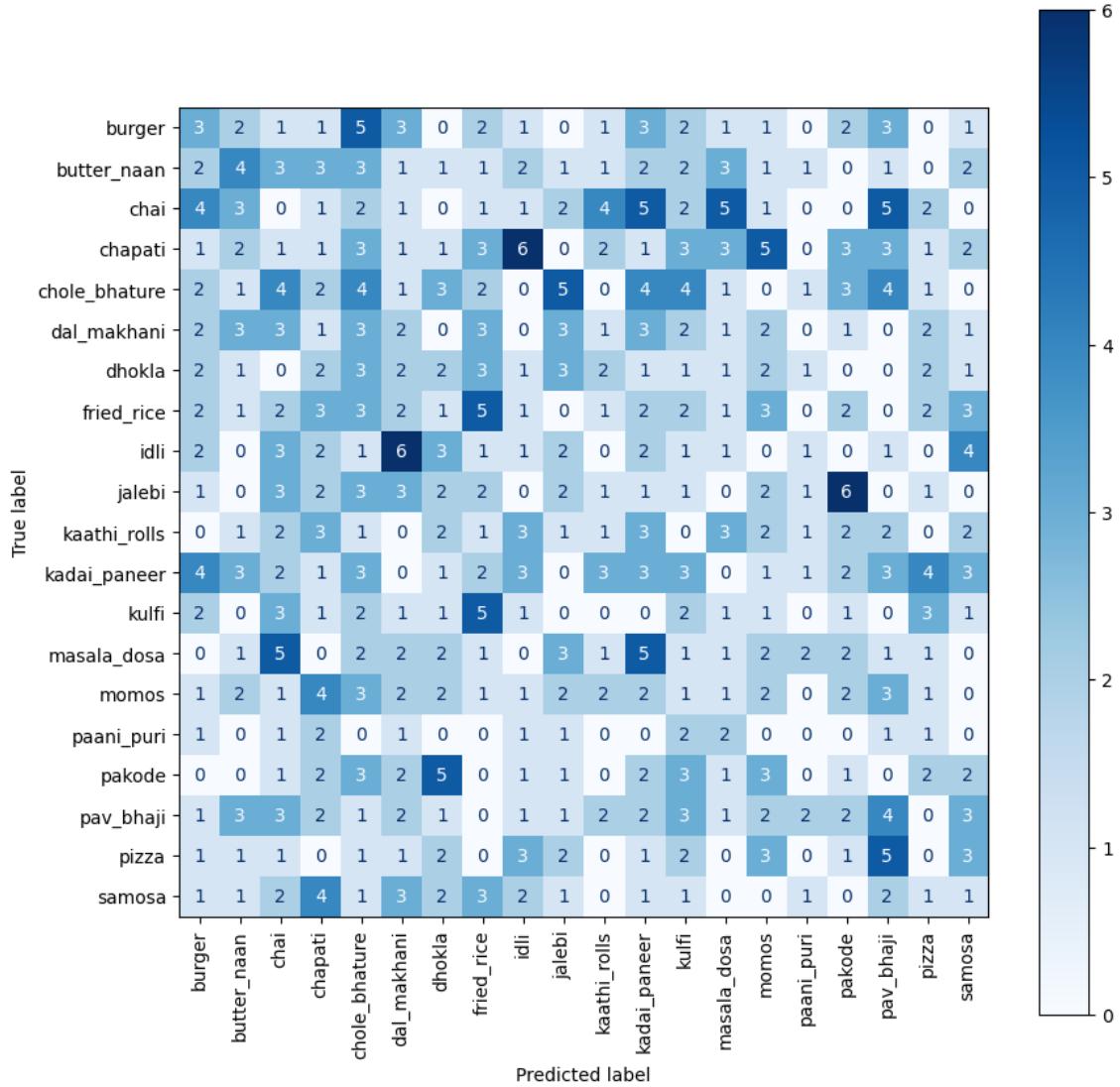


Figure 4.5: Confusion Matrix

which represent a food item from the dataset. The y-axis represents the real values and the x-axis represents the value predicted by the model. The diagonal elements show the True Positives. From the Confusion Matrix, it is visible that the model predicts some items correctly and wrongly predicts some food items. The intensity of the color shows the number of predictions made for that particular class.

4.4 Graphical Analysis

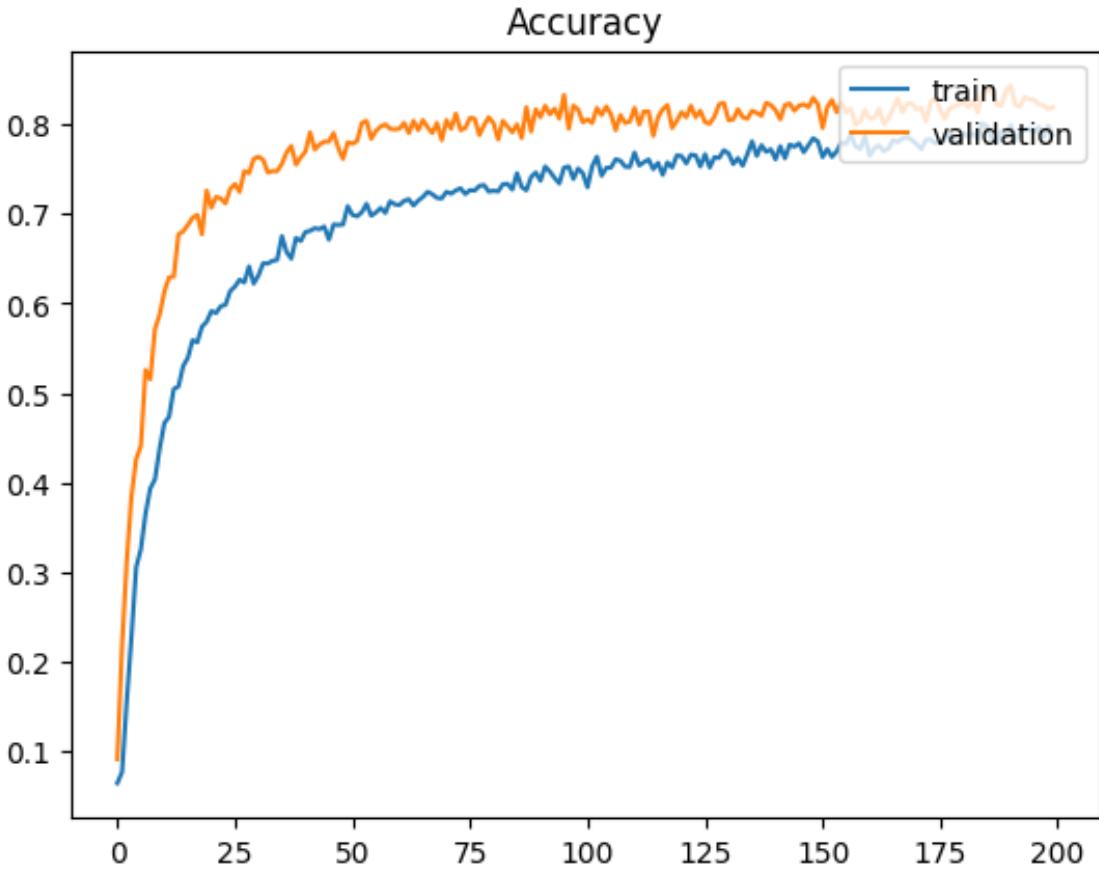


Figure 4.6: Accuracy Graph

In the initial phase, both training and validation accuracies show a rapid increase, which is typical as the model quickly learns the most obvious patterns in the data. In the mid-phase, the growth in accuracy becomes more gradual for both training and validation datasets. In the final phase, both the accuracies start to generalize and flatten out.

4.5 Discussion

The success of Food Shazam can be attributed to several key factors. Firstly, its sophisticated image recognition algorithms enable the identification of a wide array of food items with remarkable precision. By leveraging deep learning techniques, the application can analyze various visual cues and patterns to determine the composition of each dish accurately.

Furthermore, Food Shazam's extensive nutritional database serves as a valuable resource for retrieving information on the nutritional profile of different foods. This database is continually updated and refined to ensure the accuracy and relevance of the data provided to users.

Despite the overall success of Food Shazam, some deviations in results may occur under certain circumstances. For instance, variations in food presentation or lighting conditions can impact the accuracy of the image recognition process. Additionally, the application may encounter challenges when identifying less common or homemade dishes that are not well-represented in its database.

To address such deviations, ongoing improvements and optimizations are essential. This includes refining the image recognition algorithms to enhance their robustness and adaptability to diverse food items. Additionally, expanding the nutritional database to include a broader range of dishes and ingredients can further improve the application's accuracy and relevance.

In summary, the results obtained from testing Food Shazam highlight its effectiveness as a valuable tool for accessing nutritional information based on food images. Through a combination of advanced image recognition technology and an extensive nutritional database, the application offers users a convenient and reliable means of making informed dietary choices. Continued refinement and development will ensure that Food Shazam remains at the forefront of food technology, empowering individuals to prioritize their health and well-being through mindful eating practices.

Chapter 5

Conclusion

5.1 Conclusion

In conclusion, Food Shazam stands as a beacon of innovation in food technology, offering users a seamless and reliable solution for accessing detailed nutritional information with a simple image upload. Throughout our project, we have witnessed the power of advanced image recognition algorithms coupled with extensive nutritional databases to deliver accurate insights into the composition of various food items. This tool not only promotes convenience and accessibility in dietary tracking but also fosters healthier eating habits by empowering individuals to make informed decisions about their nutrition. While challenges and opportunities for improvement persist, the success of Food Shazam underscores its potential to revolutionize how we interact with food and prioritize our health and wellness.

5.2 Future Scope

Integration of Meal Recommendation Features: Food Shazam could enhance its capabilities by integrating meal recommendation features akin to HealthifyMe. This expansion would analyze user dietary preferences, nutritional goals, and past consumption patterns to offer personalized meal plans and recipe suggestions, fostering healthier eating habits.

Implementation of Restaurant Recommendations: Another avenue for future development involves incorporating restaurant recommendation functionalities within Food Shazam. By utilizing location data and user preferences, the application could provide tailored suggestions for nearby restaurants offering dishes aligning with users' dietary requirements and taste preferences, enriching the overall dining experience.

Collaboration with Food Delivery Platforms: Food Shazam could explore collaborations with food delivery apps to streamline the meal ordering process based on identi-

fied food items. By integrating with popular delivery platforms, users could seamlessly transition from discovering nutritional information to ordering meals directly from their preferred restaurants, providing a more cohesive and convenient user experience.

Partnership with Fitness Apps: Additionally, Food Shazam could establish partnerships with fitness apps to offer holistic health and wellness solutions. By sharing data and insights between platforms, users could gain a comprehensive understanding of their dietary intake and physical activity levels, empowering them to make informed decisions for their overall well-being.

Integration of Recipe Recommendations and Cooking Instructions: Furthermore, Food Shazam could expand its offerings to include recipe recommendations and cooking instructions for identified food items. By providing users with inspiration and guidance on how to prepare nutritious meals using the identified ingredients, the application would promote culinary creativity and confidence in the kitchen, further supporting users' dietary goals and preferences.

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- [4] D. J. Attokaren, I. G. Fernandes, A. Sriram, Y. V. S. Murthy and S. G. Koolagudi, "Food classification from images using convolutional neural networks," *TENCON 2017 - 2017 IEEE Region 10 Conference*, Penang, Malaysia, 2017, pp. 2801-2806, doi: 10.1109/TENCON.2017.8228338.
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Appendix A: Presentation

FOOD SHAZAM

FINAL PRESENTATION

Ms. Jyotsna A

Abhishek PS

Akshay MS

Albin John Johnny

Amith Krishnan

5/20/2024

FOOD SHAZAM 1

CONTENTS

- 3. Objectives
- 4. Scope and Relevance
- 5. System Design
- 6. Datasets (if any)
- 7. Work Division – Gantt Chart
- 8. Software/Hardware Requirements
- 9. Results
- 10. Conclusion
- 11. Future Enhancements
- 12. References

5/20/2024

FOOD SHAZAM 2

INTRODUCTION

- Food Shazam makes use of machine learning model to identify South Indian cuisines from its image.
- It also predicts the approximate amount of calories and nutritional information like calorie, carbohydrates, fat, sugar content and protein for a fixed amount of food item.
- Food Shazam is aimed at those who are new to South Indian cuisine and are unable to identify the different food items.

PROBLEM DEFINITION

- To design and develop a website that integrates AI model for food identification, listing ingredients and nutritional information aimed at users who are new to the Indian food culture.

OBJECTIVES

1. Food Identification: Identify the Indian cuisine from its image
2. Nutritional Information: Provide the user with an approximate amount of calories in the identified food.
3. Listing Ingredients: Provide the user with the general ingredients used in the preparation of the food item.
4. Healthy/Unhealthy Indicator: Determine whether the food is healthy or unhealthy based on its nutritional contents.

SCOPE AND RELEVANCE

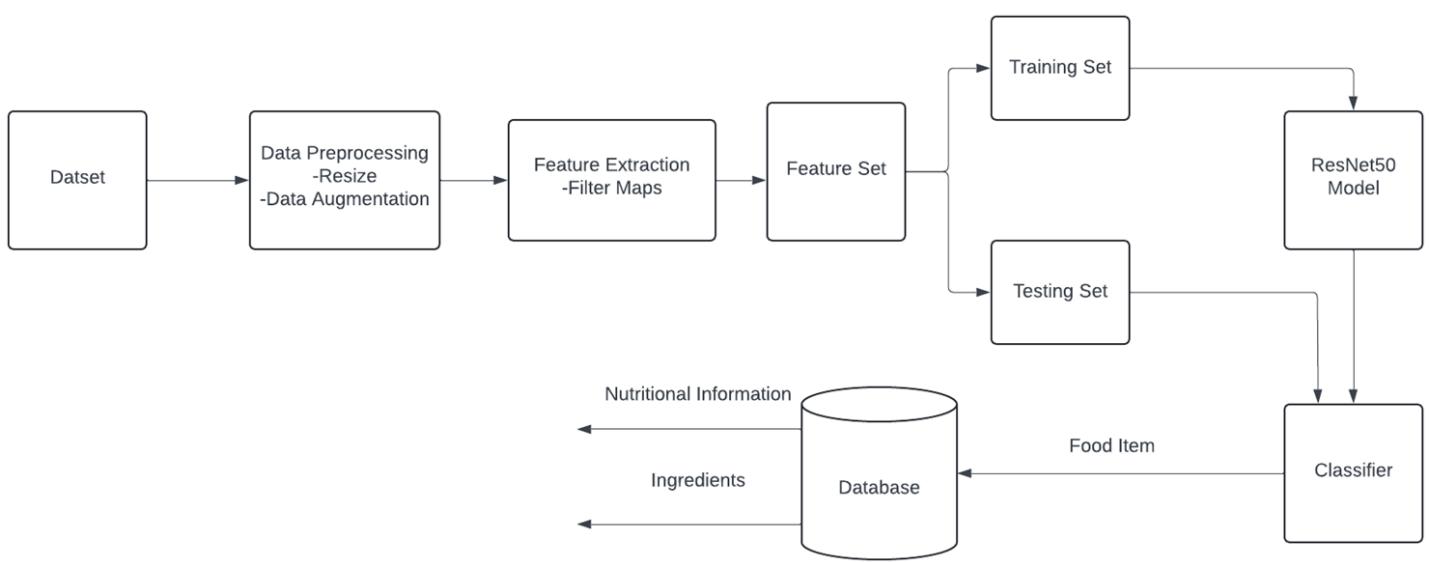
- Mention the scope of the project.
- Mention clearly what all aspects are covered in your project.
- Mention the relevance of the project
- Mention where your work is used or who find it useful/
Application
- 1 slide

SYSTEM DESIGN

4/2/2024

<Project Title>

7



OVERVIEW

1. The obtained dataset is provided for data preprocessing (resizing, data augmentation).
2. The pre-processed images are split into training and testing set.
3. The training set is then provided to the pre-trained model(ResNet50) extracting the features.
4. The testing set is used to test the model for its accuracy.

9

5. The model predicts the food item.
6. The corresponding ingredients and nutritional information of the predicted food item from the database and displays the result to the result.

MODULE DIVISION

1. Image Recognition and ML Model:

This module integrates image recognition technology to identify the Indian dish from images uploaded by users with the help of Machine Learning. It extracts relevant information from the images to facilitate dish recognition.

2. User Interface Design and Development:

This module focuses on designing and developing the user interface for the Food Shazam website. It ensures a seamless and intuitive user experience across different platforms with the help of HTML/CSS.

11

3. Database Management:

This module involves the development of the database infrastructure for the website, which is used to store ingredients and nutritional information.

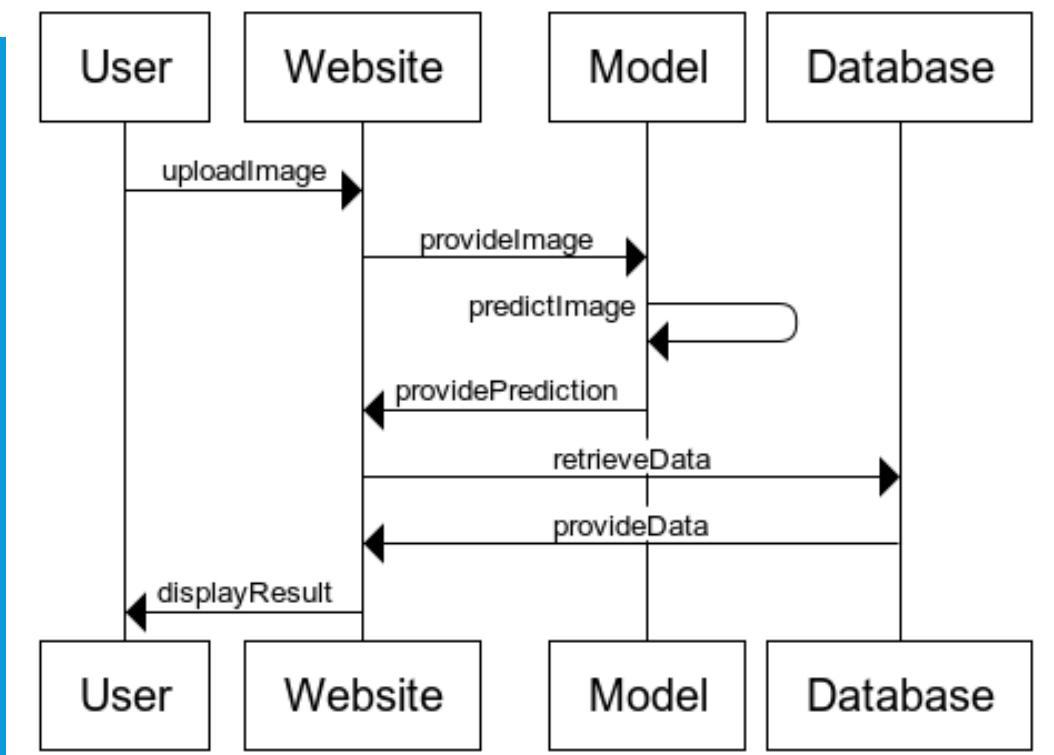
4. Testing:

This module is responsible for testing the functionality, performance, and accuracy of the Food Shazam website.

12

• SEQUENCE DIAGRAM

Sequence Diagram

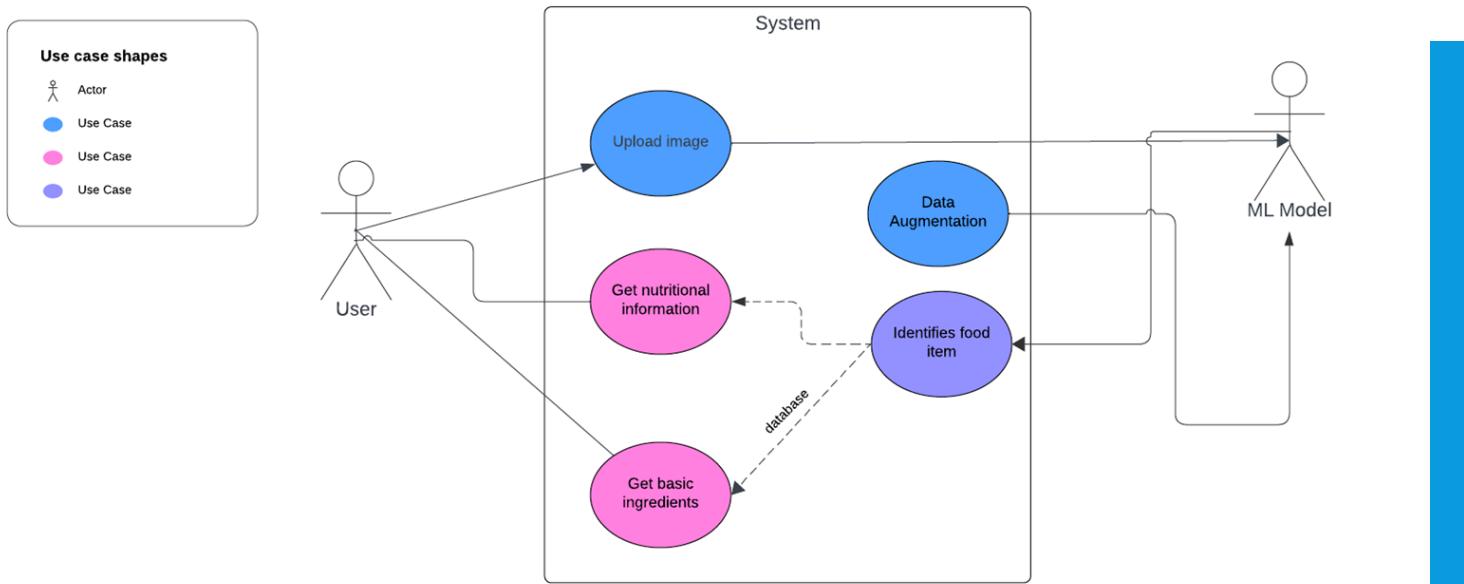


5/20/2024

FOOD SHAZAM

13

• USE CASE DIAGRAM



5/20/2024

FOOD SHAZAM

14

DATASETS

- Source: <https://www.kaggle.com/datasets/l33tcod3r/indian-food-classification>

My Drive > Food-Classification

Name	Owner	Last modified	File size	⋮
burger	me	Apr 10, 2024	—	⋮
butter_naan	me	Apr 10, 2024	—	⋮
chai	me	Apr 10, 2024	—	⋮
chapati	me	Apr 10, 2024	—	⋮
chole_bhature	me	Apr 10, 2024	—	⋮
dal_makhani	me	Apr 10, 2024	—	⋮
dhokla	me	Apr 10, 2024	—	⋮
fried_rice	me	Apr 10, 2024	—	⋮
idli	me	Apr 10, 2024	—	⋮

4/2/2024 Food Shazam 15

My Drive > Food-Classification > chapati

File	Name	⋮
001.jpg	001.jpg	⋮
002.jpg	002.jpg	⋮
003.jpg	003.jpg	⋮
004.jpg	004.jpg	⋮
005.jpg	005.jpg	⋮
006.jpg	006.jpg	⋮
007.jpg	007.jpg	⋮
008.jpg	008.jpg	⋮
009.jpg	009.jpg	⋮
010.jpg	010.jpg	⋮

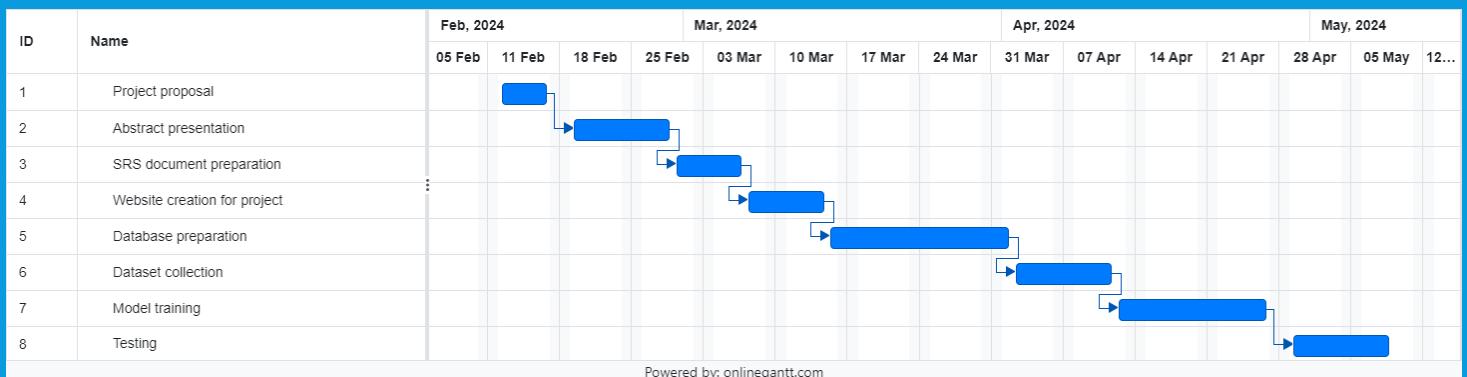
FEATURES OF DATASET

1. 6271 images.
2. Images are contained within folders of corresponding food items.
3. Folder is named after the food item.

17

WORK DIVISION

• Gantt Chart



SOFTWARE/ HARDWARE REQUIREMENTS

Software

- Python- keras, tensorflow, flask, numpy, matplotlib
- HTML/CSS

Hardware

- CPU- minimum 4 cores
- RAM- minimum 8gb

RESULTS

The screenshot shows a web browser window with three tabs all titled "FOOD SHAZAM". The URL in the address bar is "127.0.0.1:5000". The main content area features a large background image of various Indian dishes like curries, naan, and salads. Overlaid on this image are several sections of text and a file upload interface.

SERVICES

At Food Shazam, we are committed to providing exceptional service to our customers. We understand that your health is your top priority, and we are here to help you achieve your goals.

IMAGE ANALYSIS

Our image analysis service allows you to upload a picture of your food and receive an accurate nutritional graph, ingredients list, and health rating.

food item to be searched

Upload Image Of Food item
Image size must be less than 2MB

Select Image

Upload Image

5/20/2024 <Project Title> 21

This screenshot is nearly identical to the one above, but the background image has been changed to feature a large cheeseburger in the center foreground, while the rest of the Indian food is visible behind it.

SERVICES

At Food Shazam, we are committed to providing exceptional service to our customers. We understand that your health is your top priority, and we are here to help you achieve your goals.

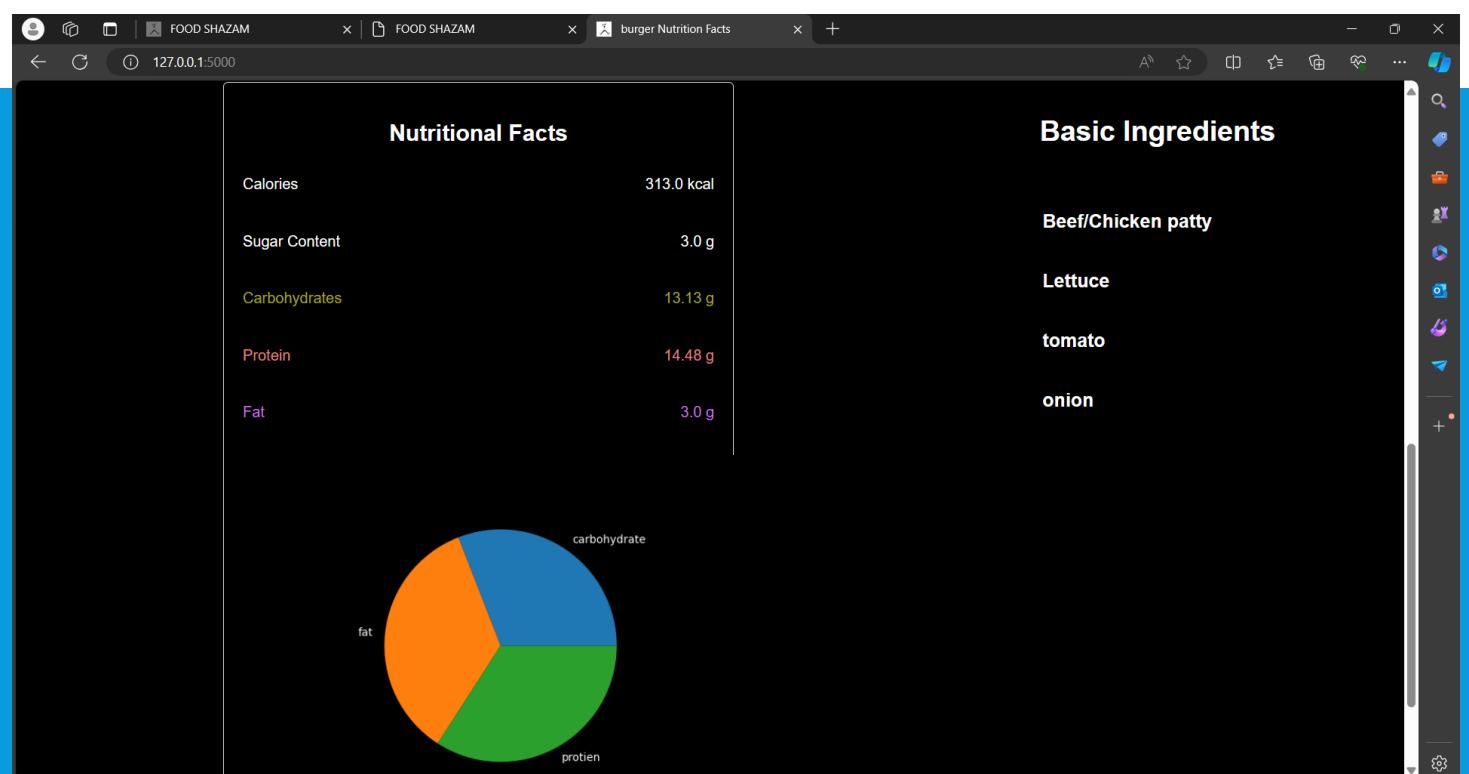
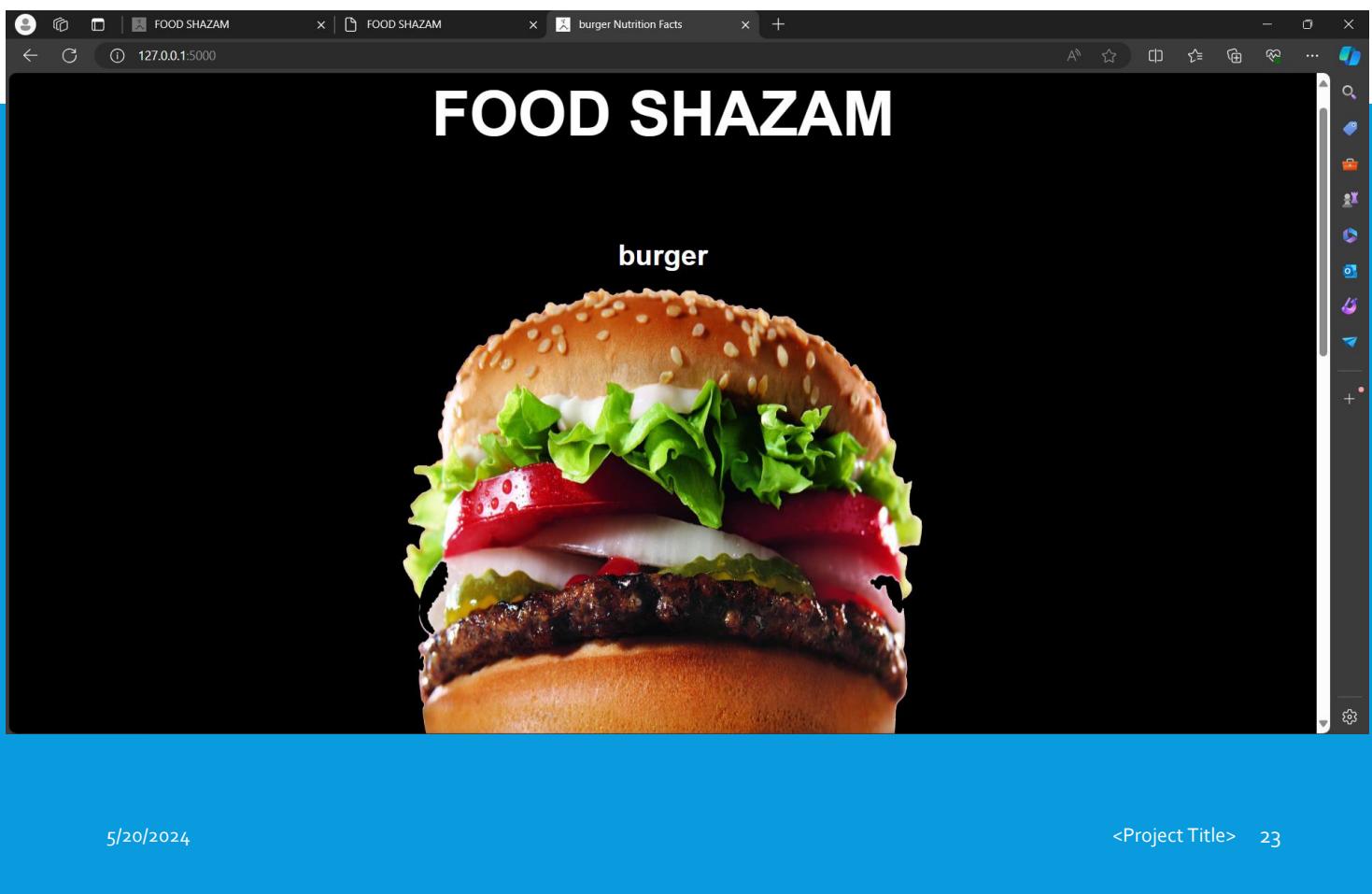
IMAGE ANALYSIS

Our image analysis service allows you to upload a picture of your food and receive an accurate nutritional graph, ingredients list, and health rating.

food item to be searched

Select Image

Upload Image



CONCLUSION

- This project has the potential to revolutionize how we discover and interact with food items. By leveraging technology to instantly identify and learn about dishes, it can empower people to explore new tastes, culture and culinary experiences.

FUTURE ENHANCEMENTS

- Integration of Meal Recommendation Features.
- Implementation of Restaurant Recommendations.
- Collaboration with Food Delivery Platforms.
- Partnership with Fitness Apps.
- Integration of Recipe Recommendations and Cooking Instructions.

REFERENCES

- W. Rawat and Z. Wang, "Deep Convolutional Neural Networks for Image Classification: A Comprehensive Review," in *Neural Computation*, vol. 29, no. 9, pp. 2352-2449, Sept. 2017, doi: [10.1162/neco_a_00990](https://doi.org/10.1162/neco_a_00990).
- M. T. Islam, B. M. N. Karim Siddique, S. Rahman and T. Jabid, "Food Image Classification with Convolutional Neural Network," *2018 International Conference on Intelligent Informatics and Biomedical Sciences (ICIIBMS)*, Bangkok, Thailand, 2018, pp. 257-262, doi: [10.1109/ICIIBMS.2018.8550005](https://doi.org/10.1109/ICIIBMS.2018.8550005). w

Appendix B: Vision, Mission, Programme Outcomes and Course Outcomes

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
RAJAGIRI SCHOOL OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)
RAJAGIRI VALLEY, KAKKANAD, KOCHI, 682039
(Affiliated to APJ Abdul Kalam Technological University)**



Vision, Mission, Programme Outcomes and Course Outcomes

Institute Vision

To evolve into a premier technological institution, moulding eminent professionals with creative minds, innovative ideas and sound practical skill, and to shape a future where technology works for the enrichment of mankind.

Institute Mission

To impart state-of-the-art knowledge to individuals in various technological disciplines and to inculcate in them a high degree of social consciousness and human values, thereby enabling them to face the challenges of life with courage and conviction.

Department Vision

To become a centre of excellence in Computer Science and Engineering, moulding professionals catering to the research and professional needs of national and international organizations.

Department Mission

To inspire and nurture students, with up-to-date knowledge in Computer Science and Engineering, ethics, team spirit, leadership abilities, innovation and creativity to come out with solutions meeting societal needs.

Programme Outcomes (PO)

Engineering Graduates will be able to:

- 1. Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and Team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

10. Communication: Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

Programme Specific Outcomes (PSO)

A graduate of the Computer Science and Engineering Program will demonstrate:

PSO1: Computer Science Specific Skills

The ability to identify, analyze and design solutions for complex engineering problems in multidisciplinary areas by understanding the core principles and concepts of computer science and thereby engage in national grand challenges.

PSO2: Programming and Software Development Skills

The ability to acquire programming efficiency by designing algorithms and applying standard practices in software project development to deliver quality software products meeting the demands of the industry.

PSO3: Professional Skills

The ability to apply the fundamentals of computer science in competitive research and to develop innovative products to meet the societal needs thereby evolving as an eminent researcher and entrepreneur.

Course Outcomes

After the completion of the course the student will be able to:

CO1:

Identify technically and economically feasible problems (Cognitive Knowledge Level: Apply)

CO2:

Identify and survey the relevant literature for getting exposed to related solutions and get familiarized with software development processes (Cognitive Knowledge Level: Apply)

CO3:

Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions of minimal complexity by using modern tools & advanced programming techniques (Cognitive Knowledge Level: Apply)

CO4:

Prepare technical report and deliver presentation (Cognitive Knowledge Level: Apply)

CO5:

Apply engineering and management principles to achieve the goal of the project (Cognitive Knowledge Level: Apply)

Appendix C: CO-PO-PSO Mapping

COURSE OUTCOMES:

After completion of the course the student will be able to

SL. NO	DESCRIPTION	Blooms' Taxonomy Level
CO1	Identify technically and economically feasible problems (Cognitive Knowledge Level: Apply)	Level 3: Apply
CO2	Identify and survey the relevant literature for getting exposed to related solutions and get familiarized with software development processes (Cognitive Knowledge Level: Apply)	Level 3: Apply
CO3	Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions of minimal complexity by using modern tools & advanced programming techniques (Cognitive Knowledge Level: Apply)	Level 3: Apply
CO4	Prepare technical report and deliver presentation (Cognitive Knowledge Level: Apply)	Level 3: Apply
CO5	Apply engineering and management principles to achieve the goal of the project (Cognitive Knowledge Level: Apply)	Level 3: Apply

CO-PO AND CO-PSO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PS O3
C O1	3	3	3	3		2	2	3	2	2	2	3	2	2	2
C O2	3	3	3	3	3	2		3	2	3	2	3	2	2	2
C O3	3	3	3	3	3	2	2	3	2	2	2	3			2
C O4	2	3	2	2	2			3	3	3	2	3	2	2	2
C O5	3	3	3	2	2	2	2	3	2		2	3	2	2	2

3/2/1: high/medium/low

JUSTIFICATIONS FOR CO-PO MAPPING

MAPPING	LOW/ MEDIUM/ HIGH	JUSTIFICATION
101003/CS6 22T.1-PO1	HIGH	Identify technically and economically feasible problems by applying the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
101003/CS6 22T.1-PO2	HIGH	Identify technically and economically feasible problems by analysing complex engineering problems reaching substantiated conclusions using first principles of mathematics.
101003/CS6 22T.1-PO3	HIGH	Design solutions for complex engineering problems by identifying technically and economically feasible problems.
101003/CS6 22T.1-PO4	HIGH	Identify technically and economically feasible problems by analysis and interpretation of data.
101003/CS6 22T.1-PO6	MEDIUM	Responsibilities relevant to the professional engineering practice by identifying the problem.
101003/CS6 22T.1-PO7	MEDIUM	Identify technically and economically feasible problems by understanding the impact of the professional engineering solutions.
101003/CS6 22T.1-PO8	HIGH	Apply ethical principles and commit to professional ethics to identify technically and economically feasible problems.
101003/CS6 22T.1-PO9	MEDIUM	Identify technically and economically feasible problems by working as a team.
101003/CS6 22T.1-PO10	MEDIUM	Communicate effectively with the engineering community by identifying technically and economically feasible problems.
101003/CS6 22T.1-P011	MEDIUM	Demonstrate knowledge and understanding of engineering and management principles by selecting the technically and economically feasible problems.
101003/CS6 22T.1-PO12	HIGH	Identify technically and economically feasible problems for long term learning.
101003/CS6 22T.1-PSO1	MEDIUM	Ability to identify, analyze and design solutions to identify technically and economically feasible problems.
101003/CS6 22T.1-PSO2	MEDIUM	By designing algorithms and applying standard practices in software project development and Identifying technically and economically feasible problems.
101003/CS6 22T.1-PSO3	MEDIUM	Fundamentals of computer science in competitive research can be applied to Identify technically and economically feasible problems.
101003/CS6 22T.2-PO1	HIGH	Identify and survey the relevant by applying the knowledge of mathematics, science, engineering fundamentals.

101003/CS6 22T.2-PO2	HIGH	Identify, formulate, review research literature, and analyze complex engineering problems get familiarized with software development processes.
101003/CS6 22T.2-PO3	HIGH	Design solutions for complex engineering problems and design based on the relevant literature.
101003/CS6 22T.2-PO4	HIGH	Use research-based knowledge including design of experiments based on relevant literature.
101003/CS6 22T.2-PO5	HIGH	Identify and survey the relevant literature for getting exposed to related solutions and get familiarized with software development processes by using modern tools.
101003/CS6 22T.2-PO6	MEDIUM	Create, select, and apply appropriate techniques, resources, by identifying and surveying the relevant literature.
101003/CS6 22T.2-PO8	HIGH	Apply ethical principles and commit to professional ethics based on the relevant literature.
101003/CS6 22T.2-PO9	MEDIUM	Identify and survey the relevant literature as a team.
101003/CS6 22T.2-PO10	HIGH	Identify and survey the relevant literature for a good communication to the engineering fraternity.
101003/CS6 22T.2-PO11	MEDIUM	Identify and survey the relevant literature to demonstrate knowledge and understanding of engineering and management principles.
101003/CS6 22T.2-PO12	HIGH	Identify and survey the relevant literature for independent and lifelong learning.
101003/CS6 22T.2-PSO1	MEDIUM	Design solutions for complex engineering problems by Identifying and survey the relevant literature.
101003/CS6 22T.2-PSO2	MEDIUM	Identify and survey the relevant literature for acquiring programming efficiency by designing algorithms and applying standard practices.
101003/CS6 22T.2-PSO3	MEDIUM	Identify and survey the relevant literature to apply the fundamentals of computer science in competitive research.
101003/CS6 22T.3-PO1	HIGH	Perform requirement analysis, identify design methodologies by using modern tools & advanced programming techniques and by applying the knowledge of mathematics, science, engineering fundamentals.
101003/CS6 22T.3-PO2	HIGH	Identify, formulate, review research literature for requirement analysis, identify design methodologies and develop adaptable & reusable solutions.

101003/CS6 22T.3-PO3	HIGH	Design solutions for complex engineering problems and perform requirement analysis, identify design methodologies.
101003/CS6 22T.3-PO4	HIGH	Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
101003/CS6 22T.3-PO5	HIGH	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools.
101003/CS6 22T.3-PO6	MEDIUM	Perform requirement analysis, identify design methodologies and assess societal, health, safety, legal, and cultural issues.
101003/CS6 22T.3-PO7	MEDIUM	Understand the impact of the professional engineering solutions in societal and environmental contexts and Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions.
101003/CS6 22T.3-PO8	HIGH	Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions by applying ethical principles and commit to professional ethics.
101003/CS6 22T.3-PO9	MEDIUM	Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.
101003/CS6 22T.3-PO10	MEDIUM	Communicate effectively with the engineering community and with society at large to perform requirement analysis, identify design methodologies.
101003/CS6 22T.3-PO11	MEDIUM	Demonstrate knowledge and understanding of engineering requirement analysis by identifying design methodologies.
101003/CS6 22T.3-PO12	HIGH	Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change by analysis, identify design methodologies and develop adaptable & reusable solutions.
101003/CS6 22T.3-PSO3	MEDIUM	The ability to apply the fundamentals of computer science in competitive research and prior to that perform requirement analysis, identify design methodologies.
101003/CS6 22T.4-PO1	MEDIUM	Prepare technical report and deliver presentation by applying the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
101003/CS6 22T.4-PO2	HIGH	Identify, formulate, review research literature, and analyze complex engineering problems by preparing technical report and deliver presentation.

101003/CS6 22T.4-PO3	MEDIUM	Prepare Design solutions for complex engineering problems and create technical report and deliver presentation.
101003/CS6 22T.4-PO4	MEDIUM	Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions and prepare technical report and deliver presentation.
101003/CS6 22T.4-PO5	MEDIUM	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools and Prepare technical report and deliver presentation.
101003/CS6 22T.4-PO8	HIGH	Prepare technical report and deliver presentation by applying ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
101003/CS6 22T.4-PO9	HIGH	Prepare technical report and deliver presentation effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.
101003/CS6 22T.4-PO10	HIGH	Communicate effectively with the engineering community and with society at large by prepare technical report and deliver presentation.
101003/CS6 22T.4-PO11	MEDIUM	Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work by prepare technical report and deliver presentation.
101003/CS6 22T.4-PO12	HIGH	Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change by prepare technical report and deliver presentation.
101003/CS6 22T.4-PSO1	MEDIUM	Prepare a technical report and deliver presentation to identify, analyze and design solutions for complex engineering problems in multidisciplinary areas.
101003/CS6 22T.4-PSO2	MEDIUM	To acquire programming efficiency by designing algorithms and applying standard practices in software project development and to prepare technical report and deliver presentation.
101003/CS6 22T.4-PSO3	MEDIUM	To apply the fundamentals of computer science in competitive research and to develop innovative products to meet the societal needs by preparing technical report and deliver presentation.
101003/CS6 22T.5-PO1	HIGH	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
101003/CS6 22T.5-PO2	HIGH	Identify, formulate, review research literature, and analyze complex engineering problems by applying engineering and management principles to achieve the goal of the project.

101003/CS6 22T.5-PO3	HIGH	Apply engineering and management principles to achieve the goal of the project and to design solutions for complex engineering problems and design system components or processes that meet the specified needs.
101003/CS6 22T.5-PO4	MEDIUM	Apply engineering and management principles to achieve the goal of the project and use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
101003/CS6 22T.5-PO5	MEDIUM	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools and to apply engineering and management principles to achieve the goal of the project.
101003/CS6 22T.5-PO6	MEDIUM	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities by applying engineering and management principles to achieve the goal of the project.
101003/CS6 22T.5-PO7	MEDIUM	Understand the impact of the professional engineering solutions in societal and environmental contexts, and apply engineering and management principles to achieve the goal of the project.
101003/CS6 22T.5-PO8	HIGH	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice and to use the engineering and management principles to achieve the goal of the project.
101003/CS6 22T.5-PO9	MEDIUM	Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings and to apply engineering and management principles to achieve the goal of the project.
101003/CS6 22T.5-PO11	MEDIUM	Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments and to apply engineering and management principles to achieve the goal of the project.
101003/CS6 22T.5-PO12	HIGH	Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change and to apply engineering and management principles to achieve the goal of the project.
101003/CS6 22T.5-PSO1	MEDIUM	The ability to identify, analyze and design solutions for complex engineering problems in multidisciplinary areas. Apply engineering and management principles to achieve the goal of the project.

101003/CS6 22T.5-PSO2	MEDIUM	The ability to acquire programming efficiency by designing algorithms and applying standard practices in software project development to deliver quality software products meeting the demands of the industry and to apply engineering and management principles to achieve the goal of the project.
101003/CS6 22T.5-PSO3	MEDIUM	The ability to apply the fundamentals of computer science in competitive research and to develop innovative products to meet the societal needs thereby evolving as an eminent researcher and entrepreneur and apply engineering and management principles to achieve the goal of the project.