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## Ai Based Web Application for Diet Planning and Recommended Exercise

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### ABSTRACT

This article presents the structure, mainly random forests, CNNs, and image processing techniques for nutritional proposals, about web-based personalized diet planners using machine learning algorithms and deep learning. To create a personalized diet plan, data from users should be analyzed related to health indicators, diet and daily calorie intake perspectives. Furthermore, image processing techniques allow users to recognize ingredients from images uploaded by users based on a variety of recipes of available ingredients. Machine learning, along with image processing for projects, simplifies dietary planning for people with specific health conditions such as diabetes and high blood pressure, helps them eat healthily. Preliminary results showed high levels of accuracy in both personalized nutritional recommendations and component detection.

**Keywords:** diet planning, machine learning, deep learning, random forest, nutrition.

Given the increased incidence of malnutrition disorders such as diabetes, hypertension and obesity, there is an increasing need for more sophisticated devices to support people managing their diet. This article presents a web-based personalized diet planner that uses machine learning and image processing to use machine learning and image processing, taking into account your health status and food preferences available to users. The system aims to promote this process, prepare healthy meals and meet all people's needs for proper nutrition.

### OVERVIEW

Main requirement of this project is the design of a diet planner with algorithms for machine learning, providing personalized recommendations supported by image processing. It is a function of analyzing user data such as health indicators and food restrictions with random forest algorithms to create diet planning strategies. By using image processing, the system is constructed in terms of identifying recipes from images transferred by the user. The system uses technology for machine learning and image recognition, which provides highly personalized nutritional advice and allows you to propose recipes based on current ingredients. It's a better way to handle meals easier and time-efficient.

### LITERATURE REVIEW

[1] This article presents an approach to creating individual menus based on nutritional data. The system allows flexible recommendations for users regarding nutrition that complement simplicity and detail with a deep analysis of food calories, macros and micronutrients. The applicability of the system is easy and simple for a variety of nutritional requirements, but it relies heavily on detailed food data. Therefore, at least users who have found basic knowledge of nutrition science can only access it.

[2] This paper introduces a system that uses machine learning to provide diet plans, particularly to diabetic patients. The system provides dynamic advice from realtime on diabetes management, including analyzing medical data such as blood glucose and BMI. This special approach to diabetes management limits the broader application of the system to other health conditions. The machine learning in this study shows that by recommending nutritional planning, you can benefit from people with diabetes. They do this with models that include trees and random forests that make decisions that will help with early intervention for people at risk of extinction. However, accuracy depends on the quality of the data records, and its use is limited beyond diabetes management

[3] This paper in particular uses deep learning. The LSTM network is used for adaptive diet plans that can be developed according to user habits. This is a dynamic system and improves over time. It fits more technical users or advanced environments, taking into account the fact that the requirements for arithmetic resources are very high.

[4] We will build a hybrid food recommendation system for patients with diabetes and hypertension, providing a dietary diagram that can maintain a balance between low sugar and low salt. Because the current system is so detailed, the current system is one of dynamic, dynamic static data inputs to make it more and more flexible for the end user.

The reviewed literature represents a variety of methods and applications in the field of personalized recommendation systems for nutrition. Apart from [1], most of them used machine learning or deep learning. While a regular base system is simple, the machine learning and deep learning systems make

the system more personalized and adaptable over the long term. For example, [4] aims to chronic patients and offers personalized solutions for the treatment of diseases such as diabetes and hypertension. These systems are the edge that nutritional recommendations are medically correct and have it through the general system of nutritional planning. [3] Deep learning gives the system a considerable amount of computational complexity, making it difficult for users with limited resources to access. On the contrary, systems such as those proposed by Tabassum and Rehman provide simpler solutions that can be implemented for the company's offering.

[5] has developed a food recipe recommendation system to solve some of the daily problems with house food, such as: Here, the system implements image processing, k-nearest neighbor, and content-based filtering for personal recommendations. Most importantly, his system allows users to scan the ingredients and detects ingredients and receives recommendations from the recipe. This provides a real time solution for meal planning.

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## METHODOLOGY

Hybrid design methodology to follow in your project. Machine learning, deep learning and image processing are used together to set up a personalized meal planning system. Information about users, health status, and nutritional preferences for daily calorie intake are collected. Additionally, the system uses a random forest approach, a kind of monitored algorithm for machine learning, to obtain nutritional recommendations. This is because different nutritional factors and health status are analyzed as Random Forest is very robust and maintains excellent ability to manage high-dimensional data with complexity.

This component to identify components includes the use of image processing techniques. Network Identifies and classifies the identified ingredients by folding the uploaded folding network and categorizes them by adapting to recipes that best meet the user's food requirements.

## MODELS

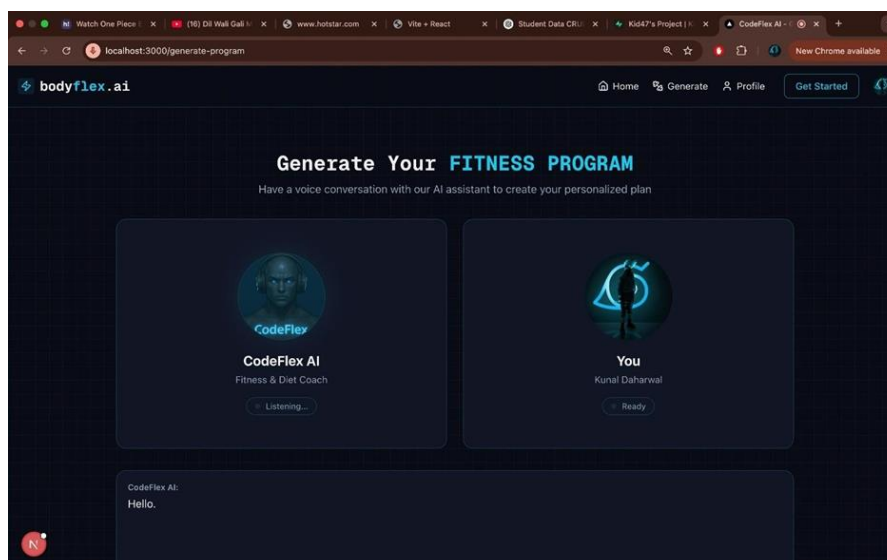
Random Forest Model: The Random Forest Model analyzes input data for health conditions such as age, weight, nutritional restriction, diabetes and hypertension. This will predict which type of food is right for you and create a personalized nutrition plan based on the predictions. This model offers an edition that combines several decisions and combines the tree to ensure a very accurate final recommendation. Image Processing Component: Uses CNN for image recognition to classify the components recorded in the user's uploaded images. The system uses a defined deep learning model to detect finely tuned components. The system then responds to recognized ingredients with a database of recipes to ensure that there are ingredients available in the produced food plan.

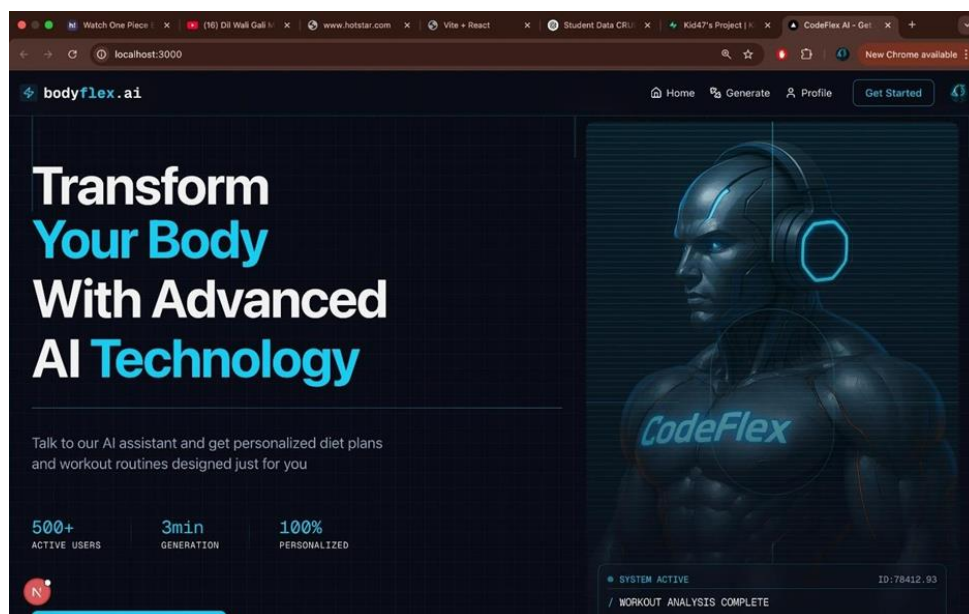
## DESIGN

The general architecture of a web based diet planner consists of a user interface for entering the health details of the available materials, food preferences, and image high shop. The backend includes a random forest model and a CNN based image processing model. The user interface is designed with Flask, a Python library for web implementations, but machine learning and image processing components are run using the Python's Scikit learn and Tensorflow libraries. The system also includes a database with recipes that allow users to receive prescription suggestions based on the ingredients available and nutritional needs.

## DESIGN

Preliminary results showed that the random Walded Forest algorithm analyzes user data very well to provide personalized meal plans. Additionally, the Image Processing section identifies components with high accuracy and enables recommendations for related recipes. The USERT test showed that the system is well user-friendly and that the personalized diet plans and recipe suggestions provided by the system will help users manage their diet and health.





## CONCLUSION

This paper proposed a personalized diet planner with machine learning and image processing for personalized diet proposals. The combination of Random Forest and CNNs allows the system to analyze user data and ingredients of the general generation of personalized diet plans to meet the special needs of human health. The proposed system has a promising view of solutions to the growth of demand for personalized nutritional management equipment. It may also affect members of medical professions who want to advise individuals about diet to control chronic illnesses.

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