

# EFFICIENT HEALTH AND NUTRITION MANAGEMENT SYSTEM

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**Abstract:** “Efficient Health and Nutrition Management System” is a web based application that works within a centralized network. The “Efficient Health and Nutrition Management System” will be used by user who hardly have time to decide what to eat for leading a healthy lifestyle. But by these web based application will help them to maintaining a fit body and hence often consult dietitian to get the perfect diet plan. Online Artificial Intelligence dietitian is a platform made by us which provides users with a system to input their physical details such as height, weight, age, gender, etc. and give output in the form of nutrient value required by user’s body and the diet plan which is needed to be followed. The website has a user interface which displays the basic information about how to maintain good health by eating food products which includes calories, vitamins, proteins and carbohydrates, etc. It also contains user login such as Admin, User and Dietitian. Overview on modules developed in this website is also given. The Online Artificial dietitian is a bot with artificial intelligence about human diets. It acts as a diet consultant comparable to a real dietitian. The software stores and processes the data and gives the dietary foods as options from which the user can choose alternative dietary food if not satisfied with the results. The artificial intelligence is trained to produce results alike a real dietitian. Results are given in the form of nutritional values associated with the particular food in the diet plan.

**Keyword:** Dietitian Food Management, Genetic Algorithm, KNN Algorithm.

## I. INTRODUCTION

This project is taken by considering the fact that in these days peoples are more aware of their health, they are always searching for ways to help them be healthier as they have become more health-conscious. Health is an important aspect of life as rightly said ‘Health is Wealth’. Hence, in order to maintain proper diet with a aim to maintain our fitness we need a system that can improve people’s awareness and help them get proper advice. We require a system that offers a wide range of advice about nutrients. As proteins, vitamins, fiber and some kind of materials. Also, the system should help the users to make a decision to

Increase or Decrease their weight by knowing their body type. Moreover, the nutrition system should provide you with meal plans and the foods you need to eat for your particular body type. Providing a system for Nutrition and diet advising adds value to user’s life. In a fast-paced time of today’s generation, when everyone is squeezed for time, each user wants a systems that abides with time-efficient and save time.

This system provides an online nutritionist where the nutritionist will review what user eat and user’s eating habits. Does all the thorough assessment of your nutritional treatment plan for the customer with a main objectives to generate a menu physically visiting a dietitian with a lowest expenditure possible. The existing system doesn’t have options whether they want gym-trainee based assistance or not. So here they will be given a option for it. Even disease- based, allergies, BMI index, alternatives, etc are kept into consideration.

This system propose an Online Artificial Intelligence Diet System for the adaptive display of nutritional information to improve the quality of life of both healthy user’s and user’s affected by chronic diet-related diseases. Overweight and obesity are defined as abnormal or excessive fat accumulation that may be harmful to health and even can even result in death. This problem can be reduced for a person if this follows a proper diet, in which the consumption of kilocalorie, carbohydrates, lipids and proteins per day are restricted. Given a database of foods to find the 5 meals each day of a week becomes a complex task. In this article a way to generate diets using genetic algorithms is presented, which one considers the restrictions mentioned and also allows establish preferences for certain food groups.

The proposed system is able to create a user’s health portfolio and provides individualized nutritional recommendation in the form of diet plan according to the health portfolio. The portfolio of the user is created through the use of dynamic real time Artificial Intelligence. The health profile includes information about the user’s health and diseases. The system can suggest not only the use of specific dietary foods compatible with the health condition, but also it may give dietary advices related to some specific health conditions.

## II. RELATED WORK

### A. BMI Calculation

The introduction of large scale food datasets, After login user has to fill personal information including age, weight, height, gender and exercise level. The exercise level is nothing but how much exercise will do use daily. On the basis of calculated BMI (Body Mass Index) and BMR (Body Mass Ratio) Artificial. The dietitian will display the proper diet plan from dietitian for a logged user like workout and food suggestions for every users. It also displays user's health like calories in their body, you are thin/healthy/overweight, etc. and also, daily Requirement: - of calories in their body.

### B. Request of Diet Chart Plan

User select the diet schedule as per the user requirement. User request the dietitian of dietchart plan in pyramid format. Dietitian can accept the request and upload the chart and is play it to user.

### C. Problems

There are a few more steps to complete. One of these is testing the performance of the Genetic algorithm and comparing the results with those obtained by using the approach given in. The other is extending the cost table and making the database suitable for working with all types of food groups. In real life a healthy daily meal should ideally consist of at least three different kinds of foods. However this is not taken into account in the implementation of this project. As a further improvement, dishes may be categorized as breakfast foods, lunch foods, dinner foods etc. As another enhancement, other state – of – the – art multi-objective GA approaches can be implemented and tested.

## III. UPLOADING PYRAMIDIMAGES

Generating a food (title, food name and instructions) from an image is a challenging task, which requires a simultaneous understanding of the food name composing the calories as well as the transformations they went through, e.g. slicing, blending or mixing with other food name, where the interplay between image and food name could provide additional insights on how the latter were processed to produce the resulting the diet chart plan.

The above diagram illustrates our approach. Our diet generating system takes a food as an input and outputs a sequence of displaying plan of diet to users. The first one represents visual features extracted from an image, while the second one encodes the ingredients extracted from the image. We start by introducing our transformer-based

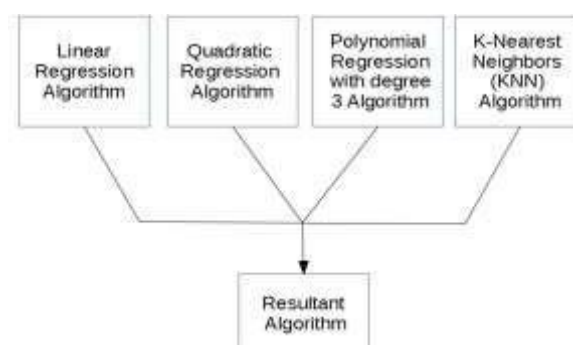
instruction decoder. This allows us to formally review the transformer, which we then study and modify to predict ingredients in an order less manner. Finally, we review the optimization details .

## IV. ALGORITHM

Algorithm is the core of the system. It is motivated by the observation that on many practical problems, algorithms have different performances. For our system, we have used a bunch of algorithms which includes:

- Linear Regression Algorithm
- Quadratic Regression Algorithm
- Polynomial Regression with degree 3 Algorithm
- K-Nearest Neighbors (KNN) Algorithm

The prediction is the resultant of combination of these various algorithms.



## V. ALGORITHM VALIDATION

We checked our algorithm's accuracy on multiple users data. Our results show visualized graphs of predicted calories against loss/ gain of weight actual calories. Our algorithms were successful at finding out the patterns. KNN did exhibit spikey behavior. The Linear Regression showed a lazy approach and didn't adapt to change very easily. KNN showed the highest volatility followed by Polynomial Regression with degree 3. Our combined method had the advantage of KNN with high volatility and was also less prone to false values because we had combined multiple regression algorithms of varying orders.

## VI. CONCLUSION

In this paper, we introduced in this paper a way to create a diet using genetic algorithms is used. As we shown in the section results we can generate each aliment time separately this give us the ability to satisfy the standard or to create our own percent to satisfy special needs. The fact of generate separately each aliment time give a versatility to the diet generator, we can create days with two heavy aliments in meal time and another with four soft aliments. We take advantage in the fact that the genetic algorithm don't ever converge to the same result, in this way we can generate different aliment configuration for the same parameters easily

This works can be improved developing the following:

1. Add to the aliment database the ability to generate diets for diabetic people.
2. Expand the database to include prepared aliments and their corresponding ingredients.
3. Expand the algorithm to consider the physic activities that the individual realizes in a day.

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