***GC University Lahore***

***Department of Computer Science***

***Final Year Project Proposal***

1. Group Memebers:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
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1. Project Title:

“Diet Detection from Food Image (Web Upload + Suggestion)”

1. Introduction:

This project, "Diet Detection from Food Image (Web Upload + Suggestion)", develops an AI-powered web application to simplify dietary tracking. Users upload a photo of their meal, and the system automatically:

* + Identifies the food using a Convolutional Neural Network (CNN).
  + Estimates its calorie and nutritional content by querying a database.
  + Provides personalized health and diet suggestions (e.g., "High in protein", "Consider more fiber").  
    The goal is to transform a simple image upload into actionable nutritional insights, promoting mindful eating.

1. Background to the problem:

Traditional methods for tracking calorie and nutrient intake rely heavily on users manually searching databases and inputting food items and quantities. This process is:

* Time-consuming: Requires significant user effort per meal.
* Error-prone: Estimates of portion sizes and ingredients are often inaccurate.
* Tedious: Leads to user frustration and abandonment of tracking efforts.

These limitations create a significant barrier to consistent and accurate dietary management. This project addresses the need for a more efficient, automated approach using computer vision to analyze food images directly, eliminating the burden of manual input.

Budgets

* No specific development budget required, only deployment/server expenses if hosted online.
* ***Low-cost Solution***: Open-source frameworks and databases are being used to minimize costs.

1. Project Scope:

This project focuses on developing a web-based application that automates dietary analysis using computer vision. The core scope encompasses:

User Interaction: A web interface allowing users to upload food images.

* AI-Powered Recognition: Utilizing a pre-trained Convolutional Neural Network (CNN) model to identify the food item(s) in the uploaded image.
* Nutritional Estimation: Retrieving estimated calorie and nutritional data (e.g., fat, protein, carbs, fiber) for the identified food from a dedicated database.
* Personalized Feedback: Generating and displaying context-aware health tips and dietary suggestions based on the identified food's nutritional profile.
* User Awareness: Providing alerts for potentially unhealthy food choices to encourage mindful eating.
* Administration: A secure admin panel for managing the food database (adding/updating items and their nutritional information).

Primary Users:

* Health-Conscious Individuals: People actively trying to manage their weight, improve nutrition, or adopt healthier eating habits.
* Fitness Enthusiasts & Gym-Goers: Individuals tracking macronutrients (protein, carbs, fat) to support fitness goals like muscle gain or fat loss.
* Dietary Beginners: People new to calorie/nutrition tracking who find manual logging complex and overwhelming.
* Busy Professionals: Those lacking time for detailed manual food diary entries.
* Individuals Seeking Mindful Eating: Users wanting instant feedback on the nutritional profile of their meals to make more informed choices.

1. **Requirements (Functional and non-functional)**

**Functional Requirements:**

* **User Features:**
  + User Registration & Login.
  + Simple Food Image Upload via web browser.
  + Automatic Food Identification (displaying detected dish name).
  + Display of Estimated Calories and Key Nutrients (e.g., Protein, Carbs, Fat, Fiber).
  + Personalized Health & Diet Suggestions (e.g., "High in Saturated Fat", "Good Source of Fiber", "Consider pairing with vegetables").
  + Mindful Eating Alerts (e.g., warnings for very high sugar/fat content).
* **Administrator Features:**
  + Secure Admin Login.
  + Food Database Management:
    - Add new food items/categories.
    - Update/Edit existing food items.
    - Set/Modify calorie and nutritional values per food item.
    - View/Manage the food database.

**Non Functional Requirements:**

* **Performance:** Process image + return results within **5 seconds max** (free-tier realistic).
* **Reliability:**Graceful error handling (invalid image, failed recognition)
* **Responsiveness:** UI feedback during processing (spinners/progress).
* **Scalability (Future):**Design for async processing to handle load spikes.
* **Availability:**Target ≥ 95% uptime (acknowledging free-tier limits).

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| *Project* | *WB* | *AI* | *NW* | *SE* | *DB* |
| *e.g.*  Diet Detection from Food Image (Web Upload + Suggestion) | *✔️* | *✔️* | *❌* | *✔️* | *✔️* |

**7) Which of the following core modules will be used in your project build upon?**

8) Tools and Technology:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Frontend | Backend | DataBase | Development Tool | Others |
| JavaScript, Html, CSS  Frame work: React | Node.js, Express.js  Or  Python, Django | MongoDB | VS code, GitHub | Multer (Express middleware)  Netlify (Frontend)  Render/Firebase (Backend) |

**Name of Supervisor(s):-------------------**

**Supervisor’s Signature**:…………………………………………… Date:……………….

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