Diet Plan Assistant For Covid-19 Recovery using Virtual Reality and Fine-Tuning

Overview

This project explores the relationship between dietary patterns and health metrics during the COVID-19 pandemic, offering a range of interactive tools for data analysis and personalized recommendations. It includes three core applications:

1. **COVID-19 Healthy Diet Dataset Analysis**
   Interactive dashboard for visualizing global food supply, nutrition metrics, and their correlation with COVID-19 health analysis.
2. **Personalized Diet Plan Generator**
   Generates dynamic diet plans tailored to user health metrics, dietary preferences, and country-specific food availability.
3. **Virtual Reality AI Assistant**
    - **Training for Professionals**: Physicians and nurses can learn more about diagnosis, emergency response, and surgery with the help of AI-powered virtual reality simulations Information
    - **Therapeutic Applications**: VR AI can provide information on mental health therapies such as exposure therapy for phobias or PTSD treatment.
    - **Patient Support**: Virtual reality assistants can assist patients with physical therapy exercises, meditation, and pre-surgery education.
    - Gaming Tools
    - Mental Health Quiz
    - Diet Plan Generation

Features

1. COVID-19 Healthy Diet Dataset

- Visualizes global food supply and nutrition metrics during the pandemic.
- Interactive visualizations using **Plotly** for better analysis.
- Handles missing data using **KNNImputer** for consistent statistical insights.

2. Personalized Diet Plan Generator

- Personalizes diet plans based on user inputs, including:
    - Age, gender, activity level
    - Health metrics like obesity and recovery status.
    - Country-specific food supply data.
- Includes stress-level analysis and dietary suggestions for mood improvement.

3. Virtual Reality AI Assistant

- Based on user input, AI responds to questions, provides clarifications, Health issues, Diet analysis but also health educational related information too.
- Included Speech to text recognition provides information based on users input.

Prerequisites

Software Requirements

- **Python 3.8+** (Download from Python's Official Website)
- **Jupyter Notebook** (for running `.ipynb` files interactively)
- **Streamlit** (for launching web-based interactive apps)

VR Development Engines:

- **Unity3D**: Creating VR Apps and Games.

3D Design and Modeling Tools:

- **Blender**: Open-source 3D modeling software is used to create VR assets.
- **Autodesk Maya** or **3ds Max**: 3D creations
- **SketchUp**: VR Architectural Designing

Python Libraries

Ensure the following libraries are installed:

- numpy
- pandas
- seaborn
- matplotlib

- plotly
- scikit-learn
- streamlit

Dataset

Datasets are stored in the `archive/` directory. The following files are required:

- `Food_Supply_kcal_Data.csv`
- `Fat_Supply_Quantity_Data.csv`
- `Protein_Supply_Quantity_Data.csv`
- `Fat_Supply_Quantity_Data.csv`

Installation Steps

Place the `archive/` folder in the root directory of the project in visual studio

Run the Applications

Launch the respective applications with the following commands:

COVID-19 Healthy Diet Dataset

streamlit run src/dataset.py

Personalized Diet Plan Generator

streamlit run src/1_Personalized\ Diet\ Plan.py

Application Details

1. COVID-19 Healthy Diet Dataset (`src/dataset.py`)

Features:

- Dropdown menu to select and view datasets.
- **Plotly** bar charts and scatter plots for insights into:

    - Mortality and obesity correlations.
    - Active cases, confirmed cases, and deaths by country.
- Mean obesity trend line added for better visualization.

Usage:

1. Select a dataset from the dropdown.
2. Explore visualizations based on health metrics (Confirmed, Deaths, Mortality, Active).
3. Analyze correlations between mortality and obesity rates.

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2. Personalized Diet Plan Generator (`src/1_Personalized Diet Plan.py`)

Features:

- User input form for:
    - Personal details (age, weight, height, etc.).
    - Health metrics (dietary restrictions, COVID-19 recovery status).
    - Lifestyle factors (activity level, calorie goal, budget).
- Generates personalized food recommendations using country-specific supply data.
- Suggests stress-relieving foods for high-stress levels.

Usage:

1. Fill in the form and click "Generate Diet Plan."
2. View personalized recommendations and insights.

3. Virtual AI Assistant

- Install Unity 3D
- Setup unity cloud by installing Unity Latest Version
- Connect to Unity Cloud
- Add Project From the disk
- Projects gets imported with assets installations and VR libraries
- In Virtual Environment we see AI Assistant with chat bot along with speech to text conversion where it also includes features like gaming, mental health quiz and diet plan generation.