

Building your own AI Nutrition Coach using a Multi-Agent System and Multimodal AI



Skills
Network

Estimated time needed: 60 minutes

Welcome, learners! Have you ever wondered how AI could become your personal health companion, guiding you to make smarter food choices effortlessly? Imagine an app that not only identifies what's on your plate, but also gives you insightful nutritional details and actionable tips—all powered by state-of-the-art AI. In the previous project, we built the foundation for such a tool: **NourishBot**, an AI-driven nutrition assistant that leverages Meta's advanced multimodal model, Llama 3.2 90B Vision Instruct, alongside Flask.

But what if we could do more? What if NourishBot could evolve beyond just recognizing food to offering dynamic, real-time advice based on various factors—like dietary preferences—as well as suggesting recipes based on what you have in your fridge? That's exactly what we're doing in this project. We're stepping into the world of Multi-Agent Systems (MAS)—a framework where multiple AI agents collaborate to make complex decisions and offer tailored guidance.

Think of it this way: one agent processes the visual input (your meal), another analyzes the nutritional content, and a third could provide meal suggestions based on your dietary preference. By working together, these agents can deliver a personalized, seamless user experience that feels less like a static app and more like an intelligent partner in your wellness journey.

To make it even better, we'll use Gradio, a simple yet powerful framework for creating interactive web apps. This means you'll walk away not just understanding advanced AI concepts, but also with a fully functional, sleek app that anyone can use.

In this 60-minute hands-on journey, you'll learn how to:

- Build and deploy a **multi-agent system** that powers intelligent decision-making.
- Integrate **multimodal AI** to handle both visual and textual data.
- Create a user-friendly interface using **Gradio**, so your app is accessible to anyone.

By the end, you'll have more than just a project—you'll have a powerful tool that could inspire future innovations in health tech, personalized AI assistants, or even smart kitchen devices.

If you're curious about how cutting-edge AI frameworks can be combined to solve real-world problems and want to gain hands-on experience with Generative AI, MAS, and multimodality, this is the perfect project for you!

Disclaimer:

The recipes and nutritional suggestions provided by this AI NourishBot are generated based on image analysis and automated processes. While we strive for accuracy and safety, these recommendations may not account for all potential dietary restrictions, allergens, or toxic ingredients.

Please note:

- Always review the suggested recipes and ingredients for safety before preparation or consumption.
- If you have specific health concerns, dietary restrictions, or allergies, consult a qualified nutritionist or healthcare provider for personalized advice.
- The AI's recommendations should be used as guidance and not as a definitive medical or dietary prescription.

By using this service, you acknowledge that while we aim to filter out unsafe suggestions, the final responsibility for ensuring recipe safety rests with you.

A quick look at AI NourishBot

What Does the AI NourishBot App Do?

Let's see a very brief demo of how the app works.

The **AI NourishBot** app is a smart dietary assistant that uses advanced AI models to analyze food images and generate helpful nutritional insights or personalized recipe ideas based on user preferences. Here's a quick recap of what the app does:

- **Food Image Analysis:**
 - Upload an image of any food item, and the app will analyze the contents to provide a detailed nutrient breakdown, including:
 - Calories
 - Macronutrients (protein, carbs, fats)
 - Micronutrients (vitamins, minerals)
- **Personalized Recipe Suggestions:**
 - For users with specific dietary restrictions (e.g., vegan, gluten-free), the app can filter ingredients and generate creative recipe ideas using only the allowed ingredients.
 - It ensures that the suggested recipes are healthy, easy to prepare, and aligned with the user's dietary needs.
- **Dietary Filtering:**
 - The app takes into account dietary restrictions such as:
 - Vegan
 - Vegetarian
 - Gluten-free
 - Keto
 - It filters out ingredients that don't comply with the specified diet.
- **Health Evaluation:**
 - Once the nutrient analysis is complete, the app provides a summary of the meal's healthiness, along with suggestions for improving its nutritional balance.
- **User-Friendly Interface:**
 - The app offers an intuitive, easy-to-use web interface built using **Gradio**, where users can:
 - Upload an image of their meal
 - Specify dietary preferences (optional)
 - Choose a workflow: either **"Recipe"** or **"Analysis"**
- **Two Main Workflows:**
 - **Recipe Workflow:** Generates recipe ideas using the detected ingredients and dietary restrictions.
 - **Analysis Workflow:** Provides detailed nutritional information and health insights for the uploaded food image.

This app is designed for anyone looking to maintain a healthy diet, experiment with new recipes, or get quick insights into their meals—all powered by AI!