

# DIET ADVISOR: AN IMAGE-BASED FOOD INTAKE ANALYSIS AND MEAL RECOMMENDATION SYSTEM

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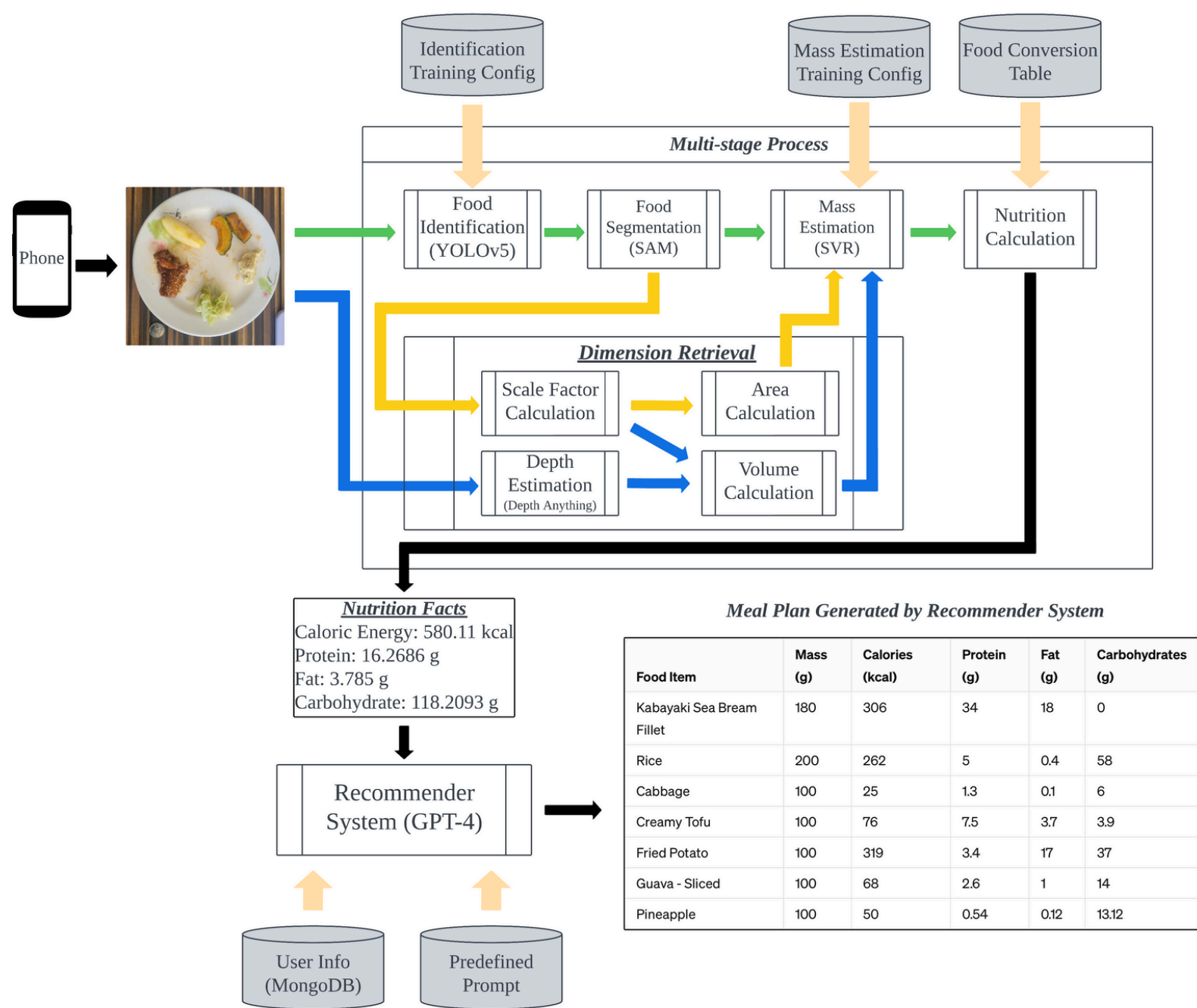
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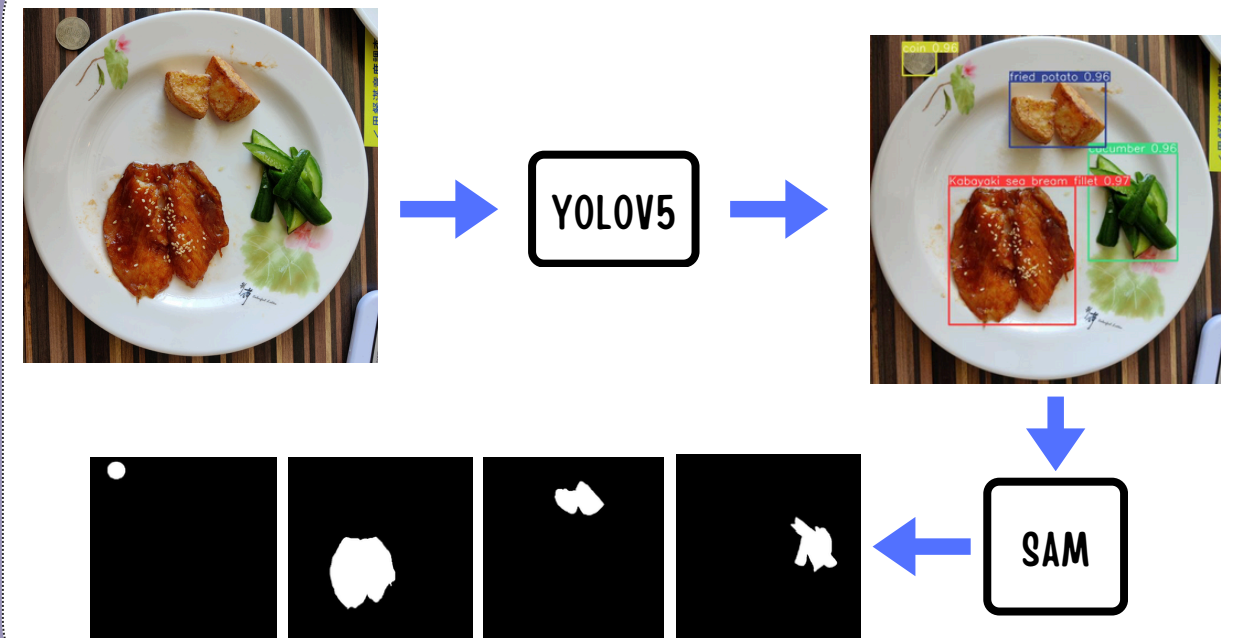
## INTRODUCTION

Introducing an innovative nutrition system that leverages advanced deep learning and computer vision to calculate the nutritional content of a meal from a single image. The system utilizes object detection model trained on a custom dataset, state-of-the-art segmentation, and depth estimation techniques to accurately determine the real-world size of food items, enhancing the precision of our machine learning model in estimating food masses for nutritional analysis. It also provides personalized meal recommendations based on user-specific physical and dietary information. The system is presented through a user-friendly interface, making it easy for users to access and navigate all functionalities.

## ARCHITECTURE



## FOOD IDENTIFICATION & SEGMENTATION



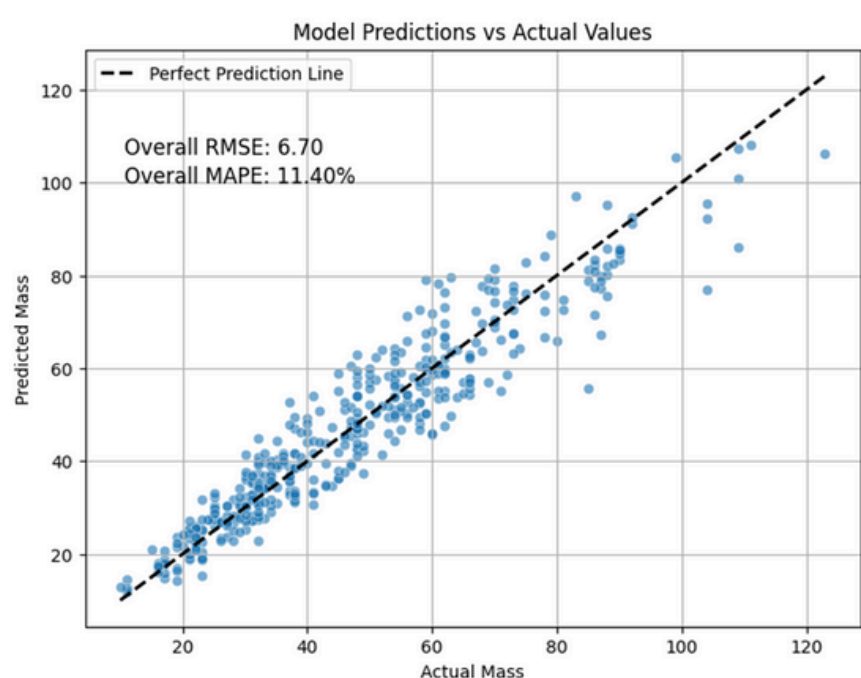
## DEPTH ESTIMATION



## MASS MODEL PERFORMANCE

Regression Algorithm	Input Data	RMSE (g)	MAPE (%)
Linear Regressor	Food type + Area	9.02	16.53
	Food type + Volume	8.78	15.67
	Food type + Area + Volume	7.78	14.35
Decision Tree Regressor	Food type + Area	9.39	16.5
	Food type + Volume	8.94	15.07
	Food type + Area + Volume	8.13	14.58
Random Forest Regressor	Food type + Area	9.31	15.31
	Food type + Volume	9.01	14.46
	Food type + Area + Volume	7.01	11.85
SVR	Food type + Area	8.13	13.63
	Food type + Volume	8.07	13.14
	Food type + Area + Volume	6.73	11.8

## REGRESSION MODEL RESULTS ON VALIDATION DATASET



TRAINED SVR MODEL ON TEST DATASET

## USER INTERFACE

**Today's Consumption**

Name	Calories	Carb
egg tofu	81.9	0.4
firm tofu	85.5	1.9
<b>Total</b>	<b>167.3</b>	<b>2.3</b>

**Meal Recommendations**  
 Powered by GPT-4  
 Get Recommendations

**Why this plan works:**

- **High protein:** The sea bream fillet is a lean protein source crucial for muscle maintenance and satiety, helping you feel fuller for longer.
- **Complex carbohydrates:** Brown rice provides sustained energy release compared to white rice, preventing blood sugar spikes and crashes.
- **Low-calorie vegetables:** Mustard greens are nutrient-rich and add volume to your meal without significantly increasing calorie intake.

**Important Notes:**

- **Portion control:** Be mindful of portion sizes to stay within your calorie goals.
- **Cooking methods:** Opt for baking, grilling, or steaming instead of frying to minimize added fat.
- **Seasoning:** Use herbs and spices liberally to enhance flavor without relying on high-calorie sauces.

Remember, this is a suggestion, and you can customize it based on your preferences and availability of ingredients. Always consult with a registered dietitian or healthcare professional for personalized dietary advice.