

Food Detection and Calorie Estimation

Deep Learning project

Team

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Idea

The project develops an image-based system for **automatic food recognition** and **calorie estimation**.

- Identify food items on a plate (e.g., apples, bananas, pizza)
- Estimate calorie values based on predefined nutritional tables
- Applications in mobile health, fitness, and dietary monitoring

Food Detection Model

- Use pre-trained CNN-based classifiers
- Datasets: [Food-101](#) or custom annotated datasets
- Output: Class labels for detected food items



Calorie Estimation Module

- Map detected food types to caloric values using a **nutritional database**
- Estimate portions via image size ratio estimation
- Output: Total estimated calories per image

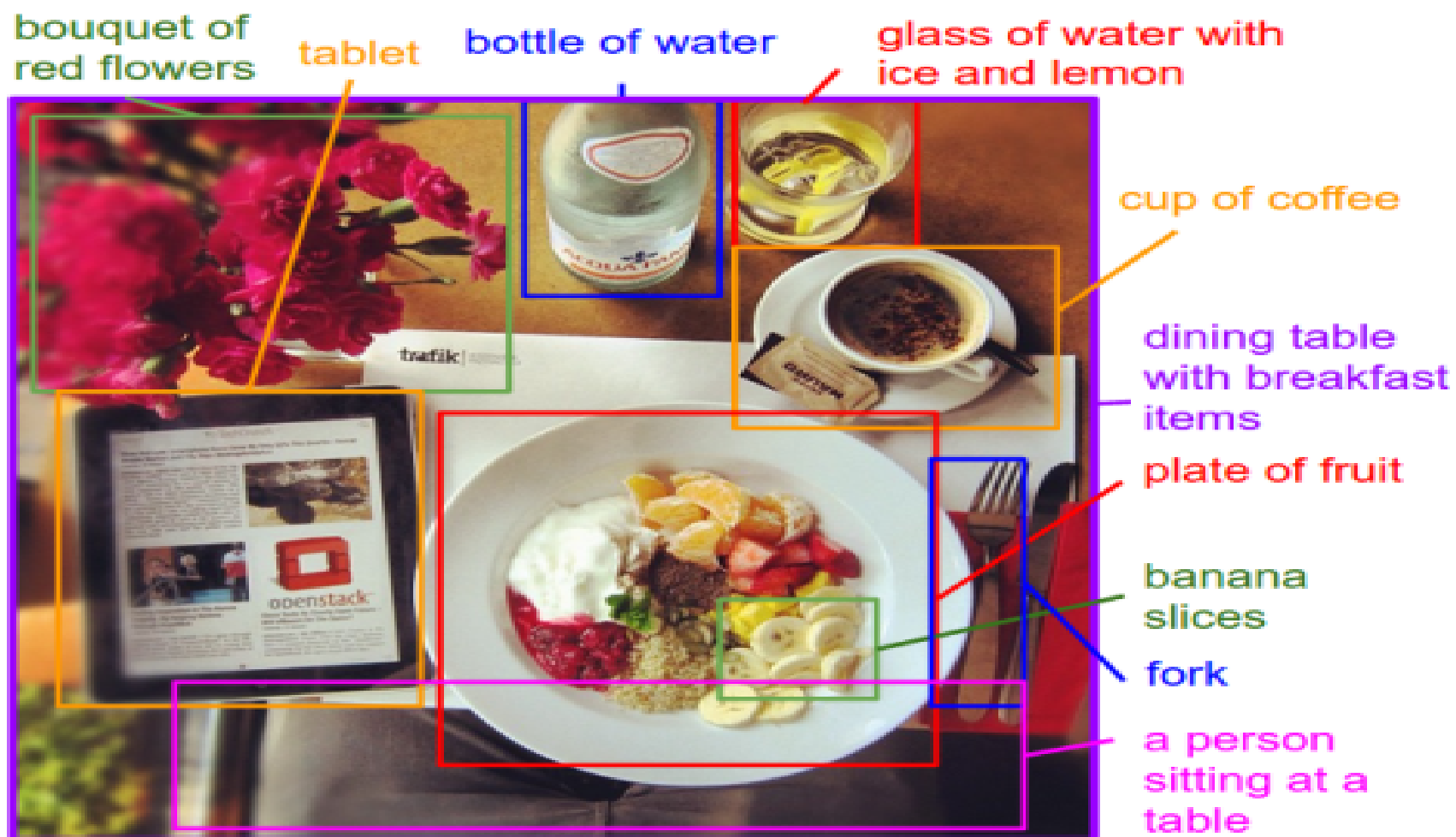
Data

Potential datasets:

- Food-101
- UEC-Food100 / UEC-Food256
- Manually annotated calorie metadata

Data preprocessing:

- Annotation of food classes
- Normalization and augmentation
- Mapping food classes to calorie entries



Technologies

- Python
- PyTorch
- Convolutional Neural Networks
- Pretrained models: ResNet, EfficientNet, YOLOv5
- Nutrition APIs or databases (e.g., USDA FoodData Central)

Difficulties

- Food item occlusion or overlapping in images
- Ambiguity in food types (e.g., pasta varieties)
- Calorie estimation without exact portion size
- Image lighting and angle variation

Relevant papers

- Improved food image
- Deep learning-based automatic food identification
- Automatic Food Recognition Using Deep Convolutional Neural Networks

Thank you!