

D4-7 MIRURECIPE:



A Mobile Cooking Recipe Recommendation System with Food Ingredient Recognition

Yoshiyuki Kawano, Takanori Sato, Takuma Maruyama and Keiji Yanai

The University of Electro-Communications, Tokyo

Background

1. decide to cook
2. decide recipe
3. go to buy food ingredients
4. confirm or change recipe
5. buy food ingredients
6. cook
7. have meal

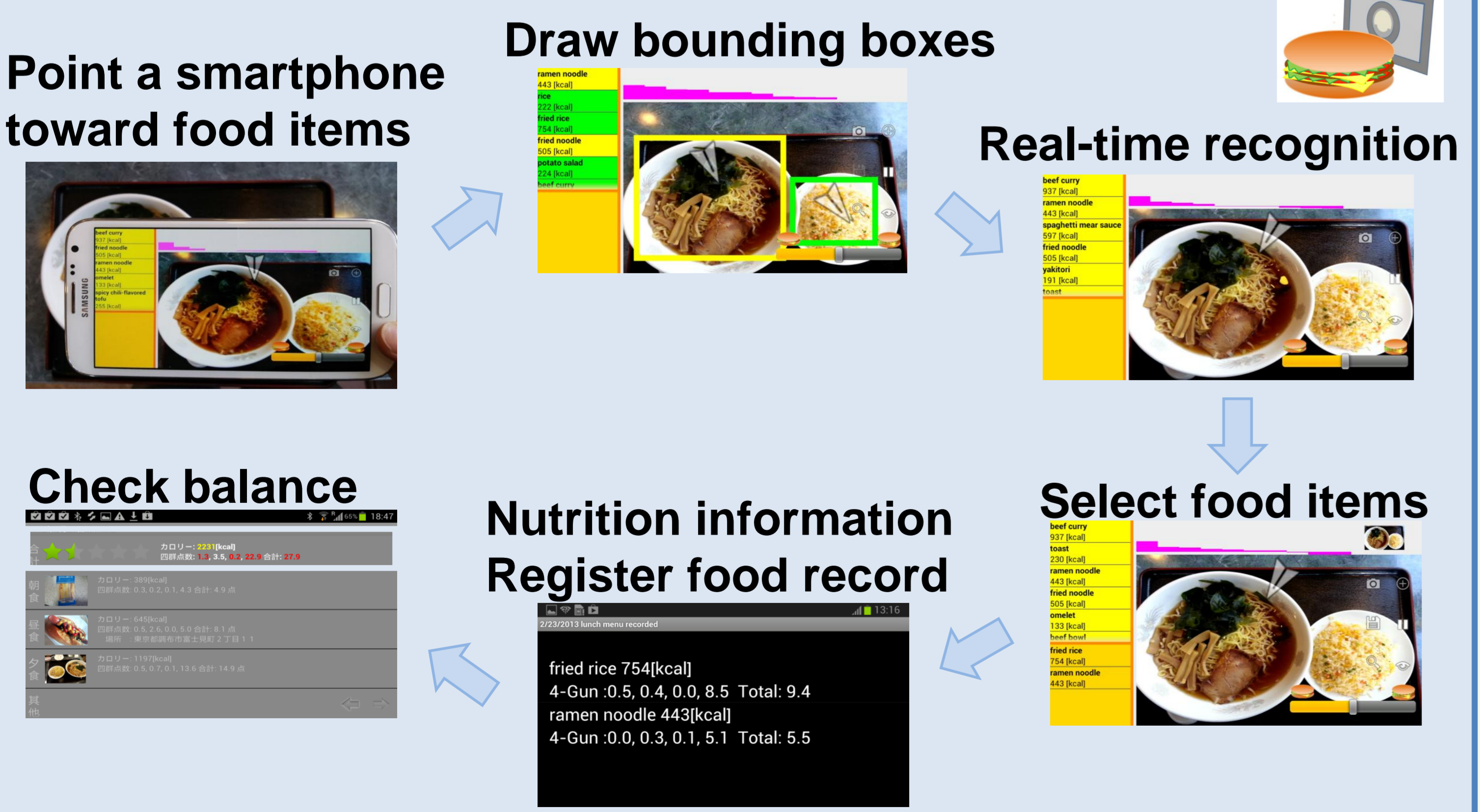
Run on the smartphone

Focus on recipe recommendation while shopping

- ① Point a smartphone camera to the food ingredients
- ② Select recipe easily and intuitively build the system

Another Mobile Application

FoodCam: Real-Time Mobile Food Recognition and Recording System (CVPR WS (IWMV) '13)



download: <http://foodcam.mobi/>
(No iPhone version)

Requirements
: Android 4.0 and up
: Quad core CPU

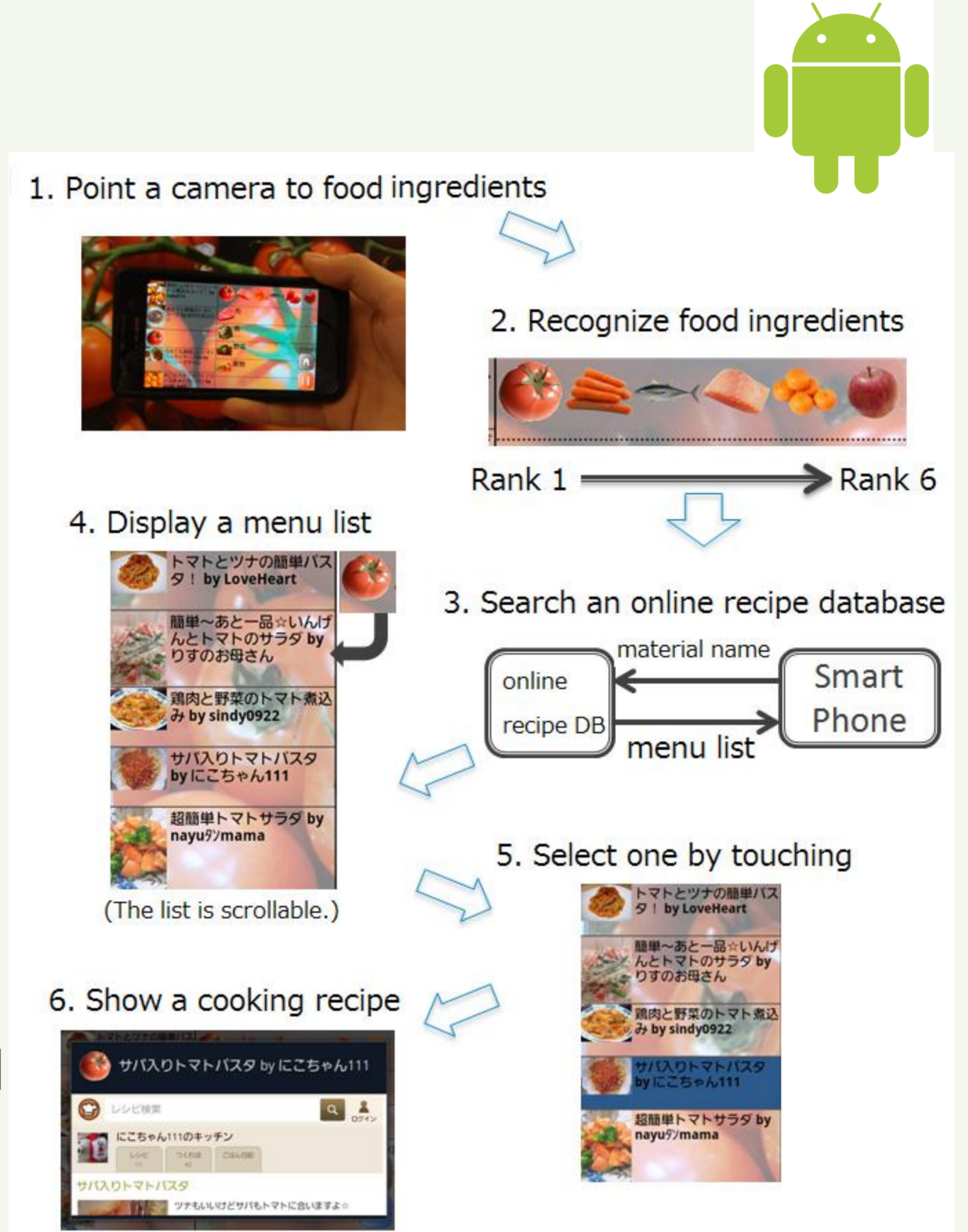


System Overview

download : <http://mirurecipe.mobi/>

Assist user to decide a recipe by using image recognition

- recognize using sequential frame image(1-5multi frames)
- Image features
 1. SURF based Bag of Features(1000 dim)
 2. Local color histogram based Bag of Features (1000dim)
- Linear SVMs
- retrieve recipes by cooking recipe API



processing flow

Recipe list	Ingredient candidates
Guacamole Grilled Chees Sandwich	
Black-Bean and Tomato Quinoa	meat
Restaurant Style Salsa	fish
Pastor Ryan's Chicken Tikka Masala	vegetables
Tomato Sauce With Onion and Butter	fruit
Three Cheese-Stuffed Shells with Meaty Tomato Sauce	

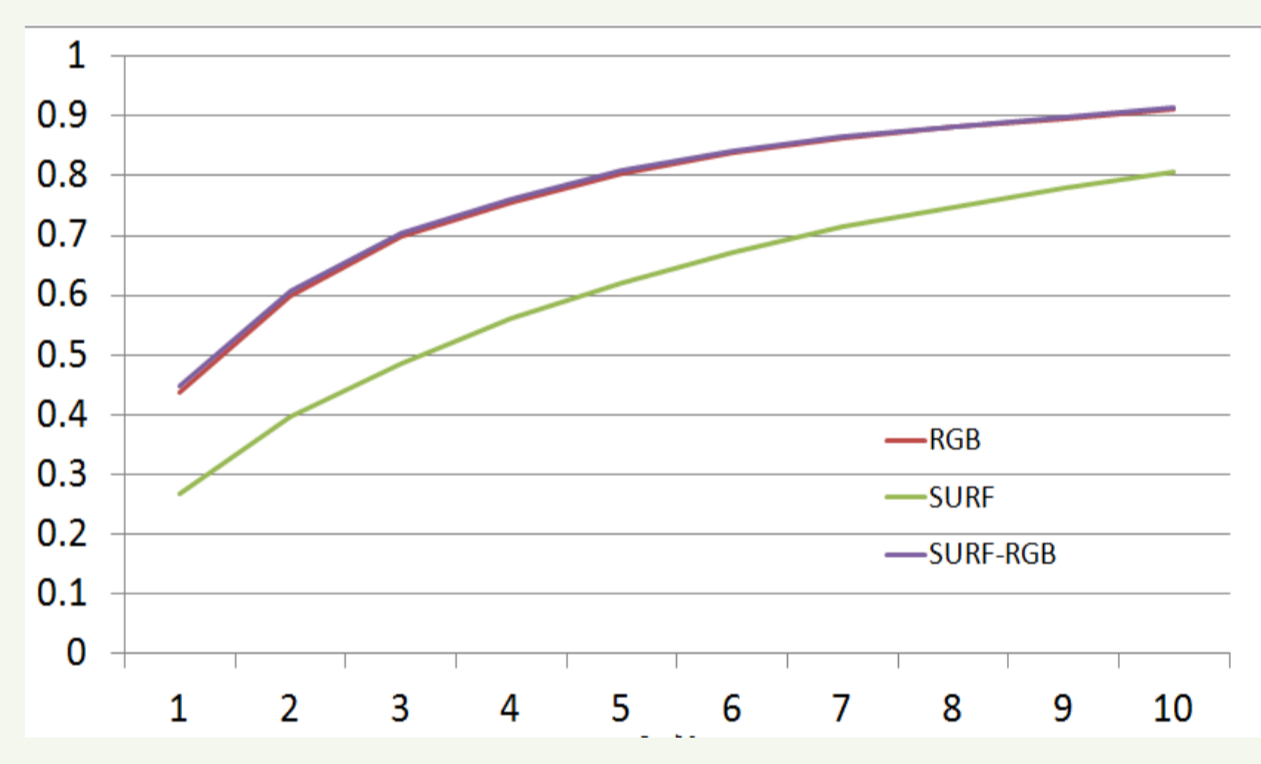
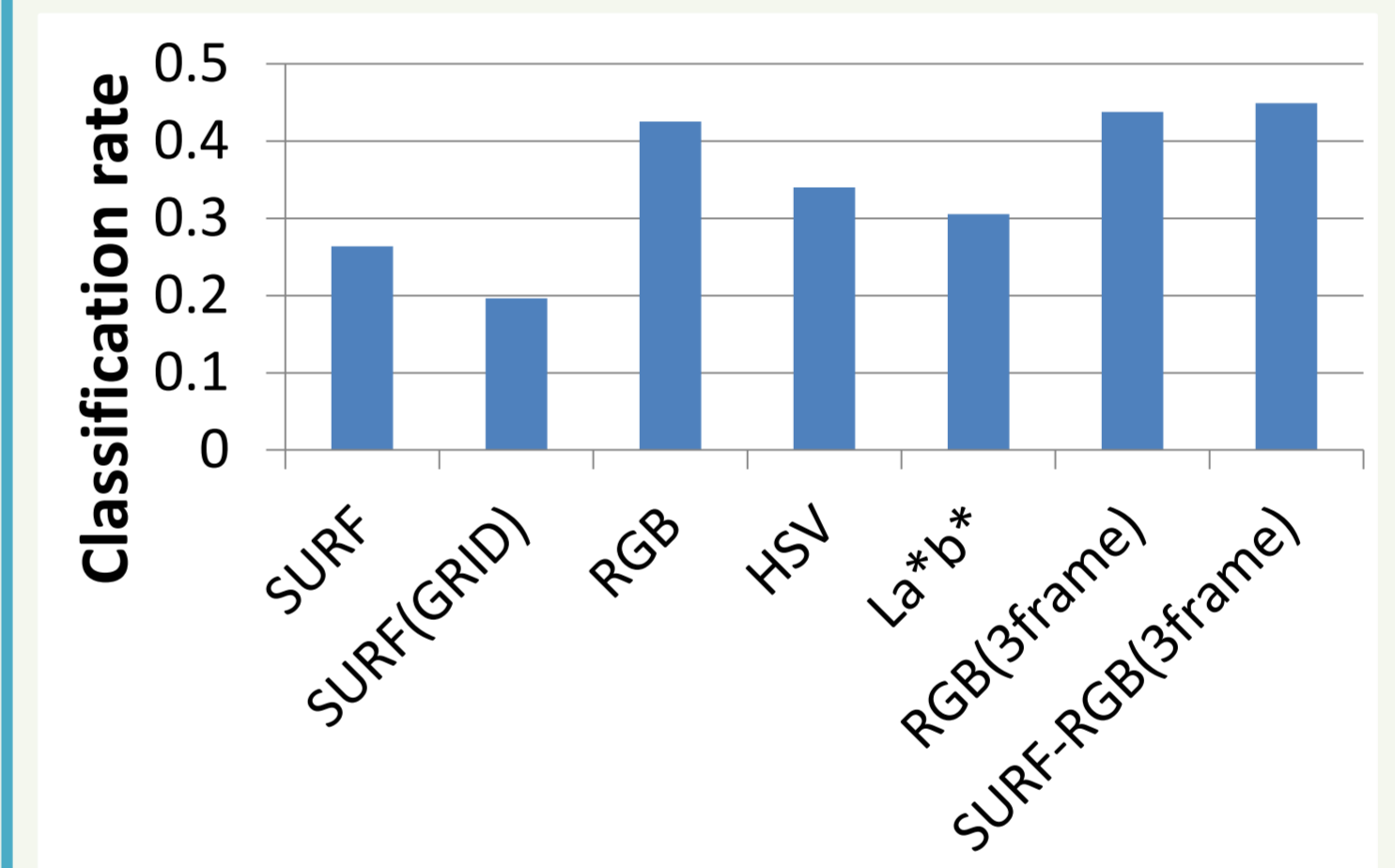
Ingredient list for hand selection

Screenshot

Experiments

Target 30 food ingredients

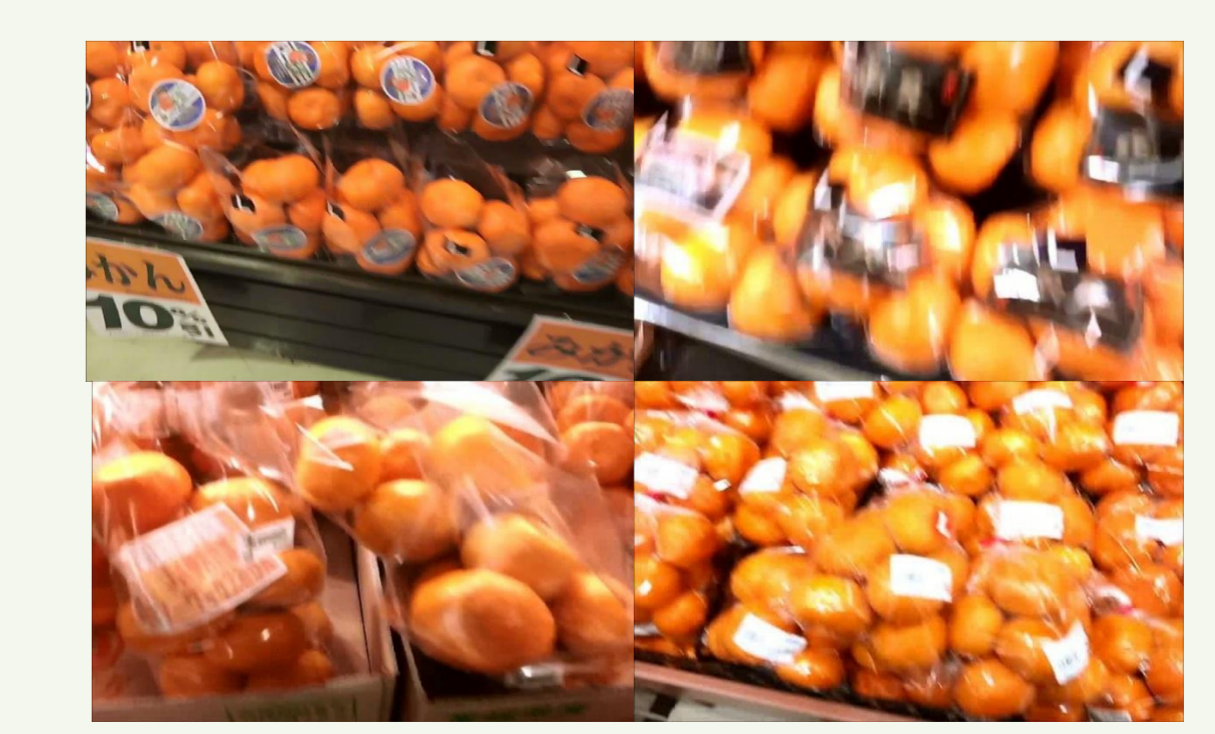
types	Food ingredients
fish	tuna, squid, octopus, shrimp, salmon
meat	beef, pork, chicken, minced meat, sausage, ham
vegetable	mushroom, potato, eggplant, carrot, radish, tomato, cucumber, cabbage, green onions, onion, chinese cabbage, lettuce, shiitake mushroom
fruit	apple, strawberry, pineapple, orange, banana, grapefruit



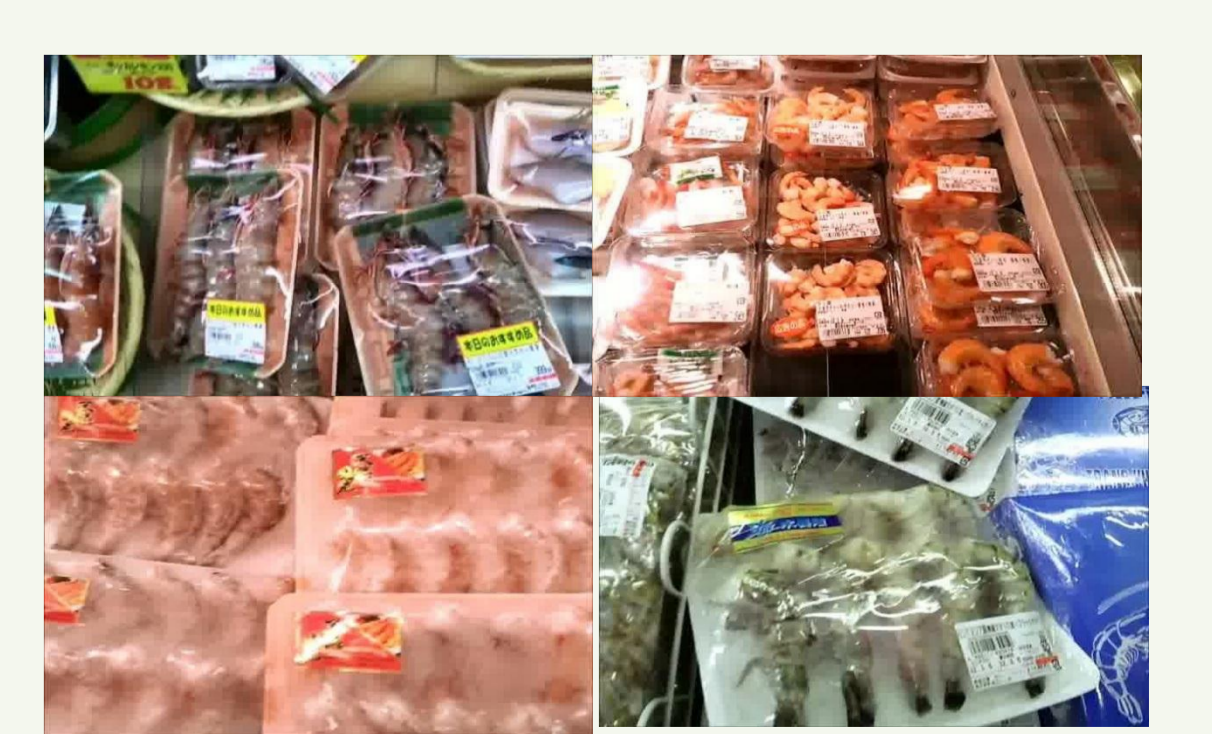
Classification rate by each method
best 44.9%

Classification rate within the top k candidates
top5 best 84.1%

Processing time :
Galaxy S2(Android2.2, 1GHz, dual core) - 0.17 second
HTC Desire HD(1GHz) - 0.39 second



easy to recognize: orange



difficult to recognize: shrimp

- Though food ingredients and recipe are automatically selected, user can also select manually.
- Only single food ingredient