Food Computing for Multimedia

Tutorial ACM MM2020

2020.10.12

Organizers

Shuqiang Jiang

Weiqing Min

Key Lab of Intelligent Information Processing,
Institute of Computing Technology, Chinese Academy of Sciences, China

Opening Remarks

Why are we organizing this tutorial?

Food Images	Cooking Videos	Recipes	Foodlog	GPS, Menu, ...	Nutrition Table	Questionnaire

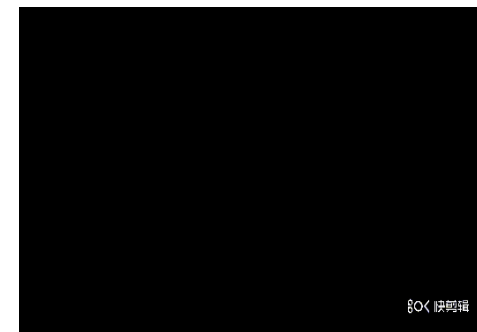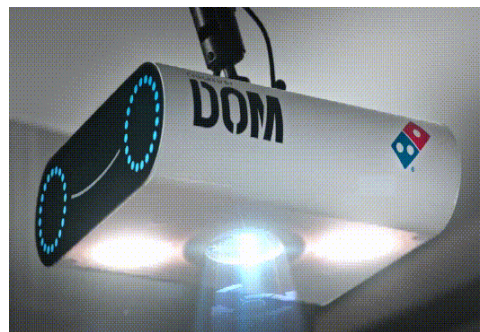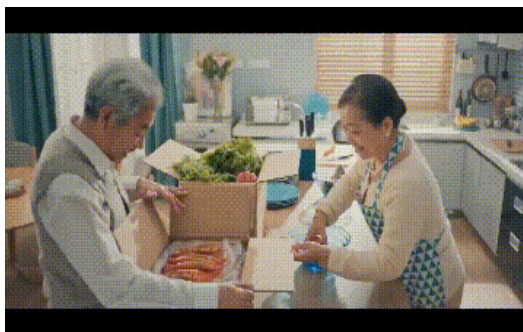Internet   Mobile networks   IOT   Social networks

Why are we organizing this tutorial?

Dietary assessment Automatic settlement Food quality detection Smart kitchen Food recommendation

Food Computing
Food data processing, analysis and modeling

| Food Images | Cooking Videos | Recipes | Foodlog | GPS, Menu,... | Nutrition Table | Questionnaire |

Why are we organizing this tutorial?

Food computing is emerging as one important topic in multimedia

Many works in multimedia
- ➢ food recognition
- ➢ cross-modal recipe retrieval
- ➢ multimodal recipe analysis
- ➢ health systems and applications
- ➢ ……

Workshops & Competitions
- ➢ MADiMa
- ➢ HealthMedia
- ➢ iFood 2019 at FGVC6
- ➢ AIcrowd-Food Recognition Challenge
- ➢ ……

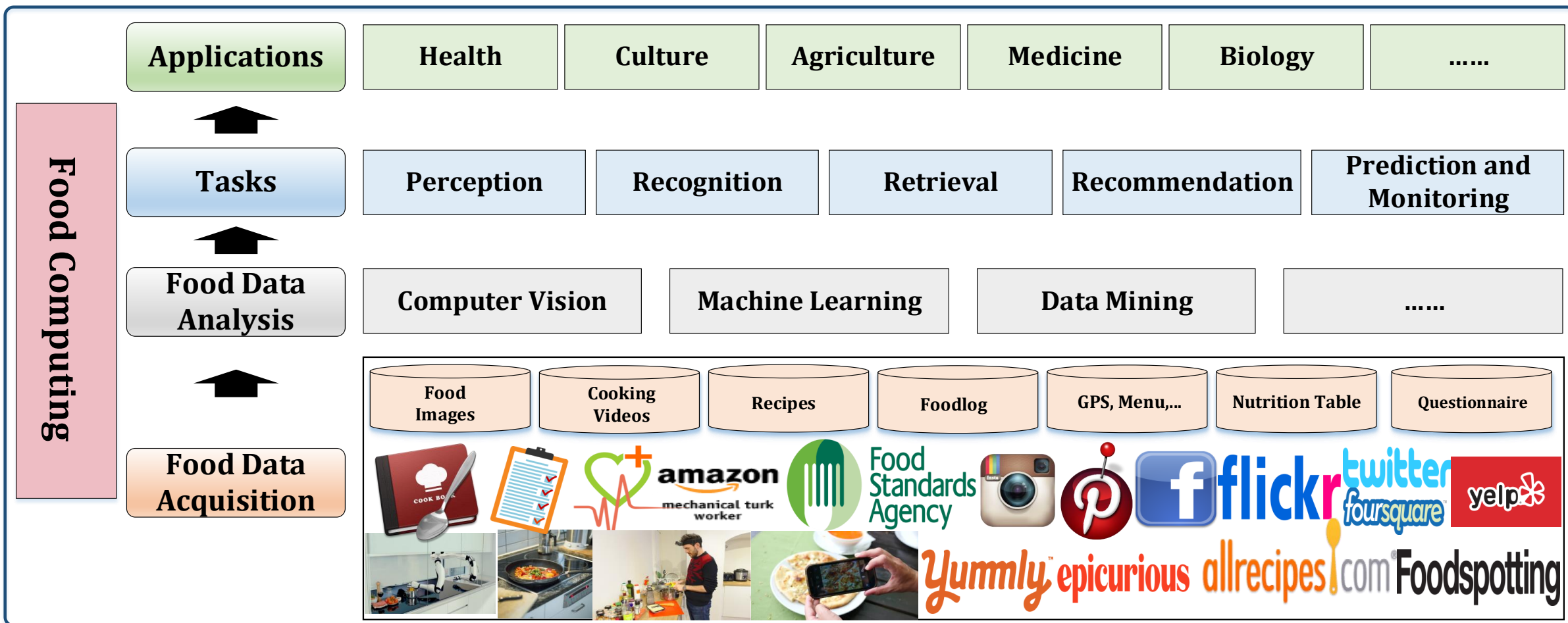**We need to take action to let more researchers know more about food computing**

Framework

Part 2
Food Recognition

Part 3
Food Retrieval& Recommendation

Part 4
Multimodal Recipe Analysis

Part 5
Cooking Action Understanding
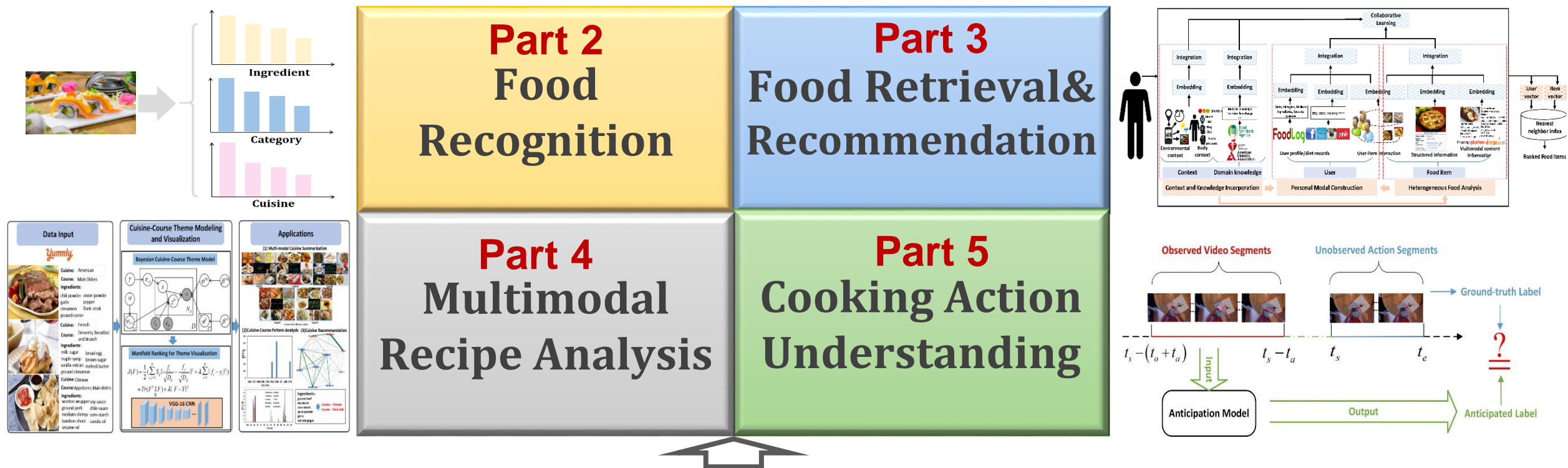
Food Computing
Part 1

Food Data Analysis				Tasks				
Multimedia	Machine Learning	Data Mining	Computer Vision	Perception	Recognition	Retrieval	Recommen dation	Prediction &Monitoring

Part 1 Food Computing

Food data acquisition ➡ **Food data analysis** ➡ **Tasks** ➡ **Applications**

Food Computing

| Applications | Health | Culture | Agriculture | Medicine | Biology | ...... |

| Tasks | Perception | Recognition | Retrieval | Recommendation | Prediction and Monitoring |

| Food Data Analysis | Computer Vision | Machine Learning | Data Mining | ...... |

Food Data Acquisition

Food Images | Cooking Videos | Recipes | Foodlog | GPS, Menu,... | Nutrition Table | Questionnaire
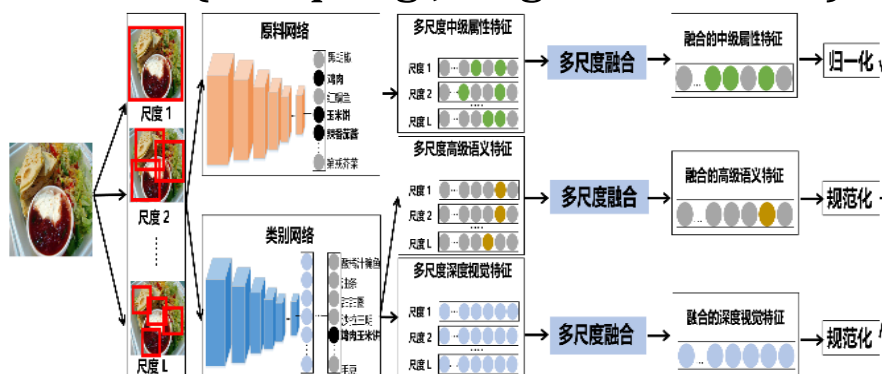

(Weiqing Min, *et al.* CSUR2019)

Part 2 Food Recognition

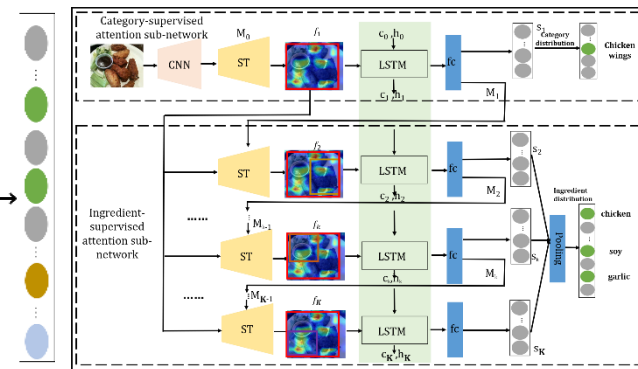## Incorporating context and knowledge for food recognition

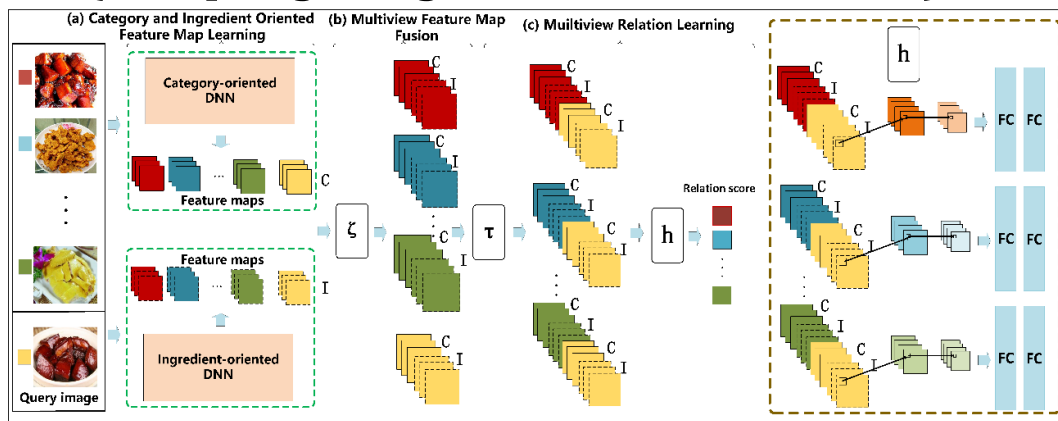(Ruihan Xu, *et al.* TMM'15) (Shuqiang Jiang *et al.* TIP'20) (Weiqing Min, *et al.* ACM MM'19)
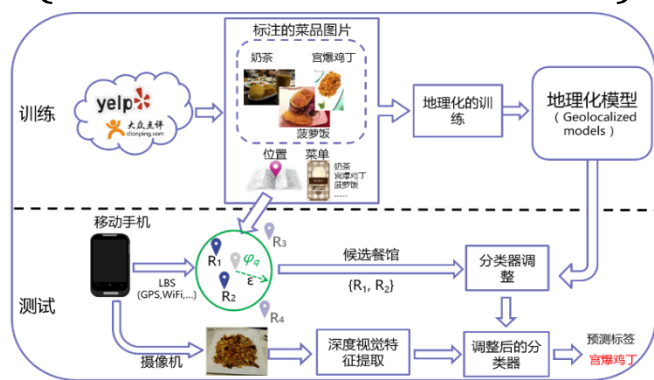
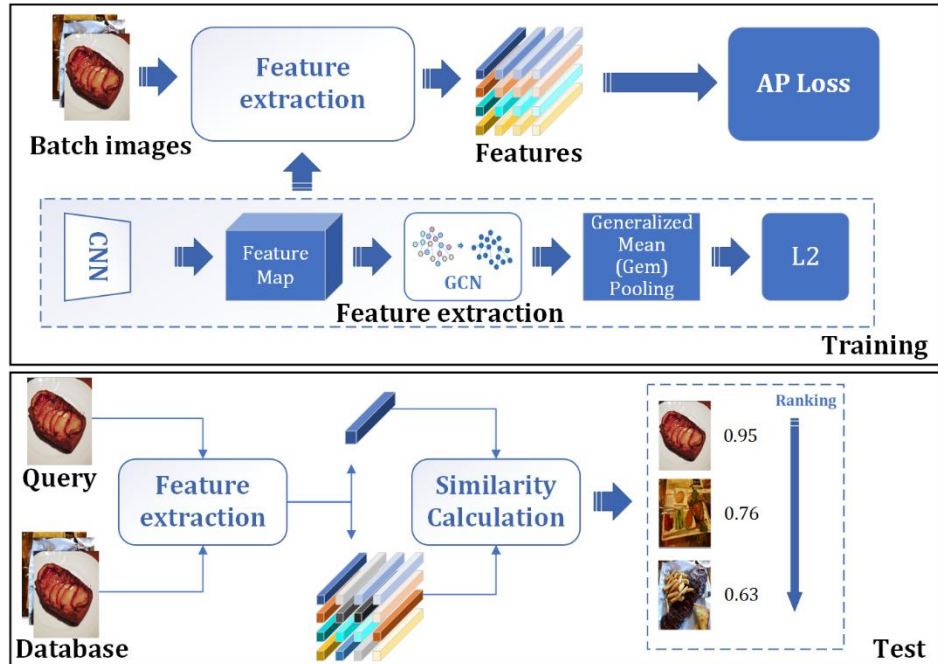## Few-shot food recognition
(Shuqiang Jiang *et al.* ACM TOMM'20)

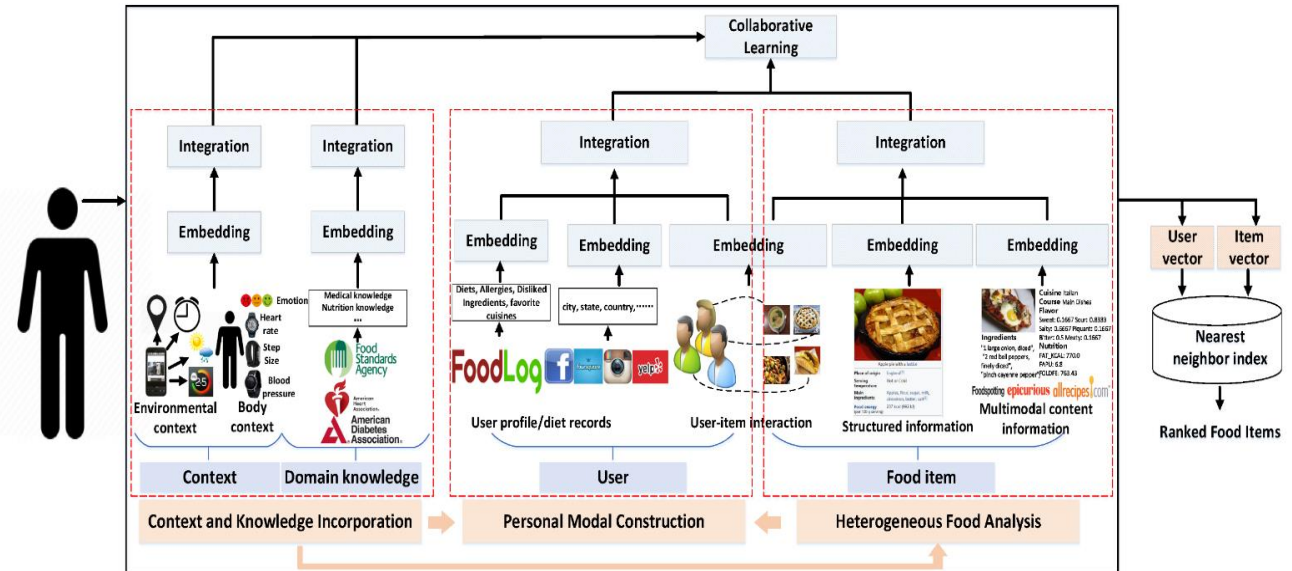## Dataset construction
(Weiqing Min, *et al.* ACM MM'19, MM'20)

Part 3 Food Retrieval &Recommendation

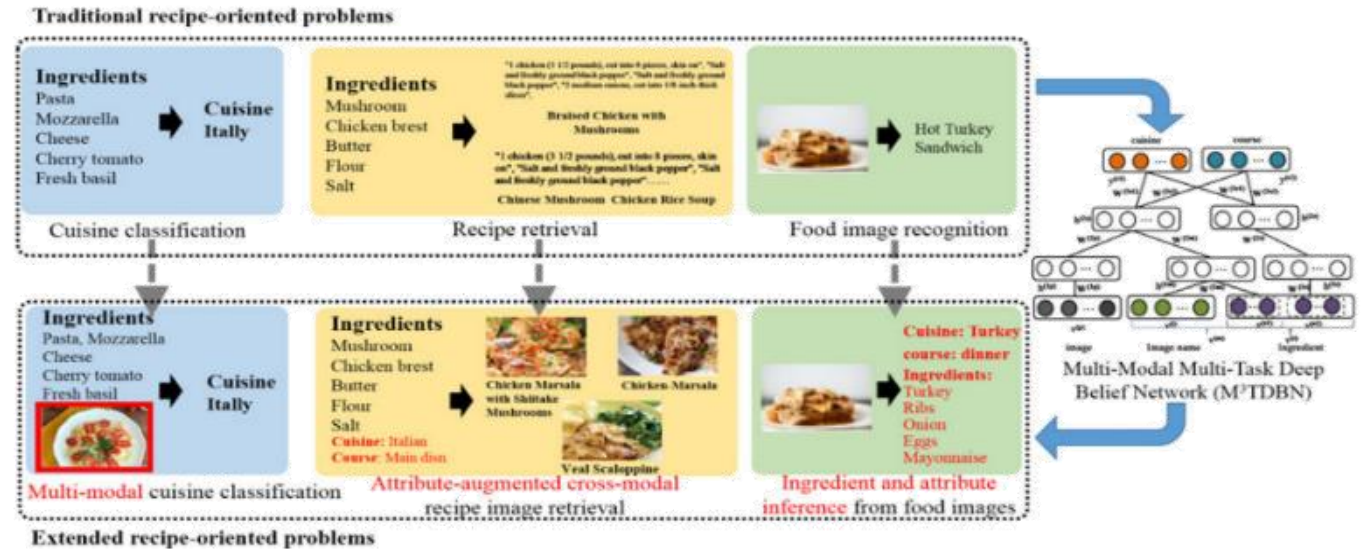## Food Retrieval

Food Recommendation

(Weiqing Min, *et al.* TMM'20)
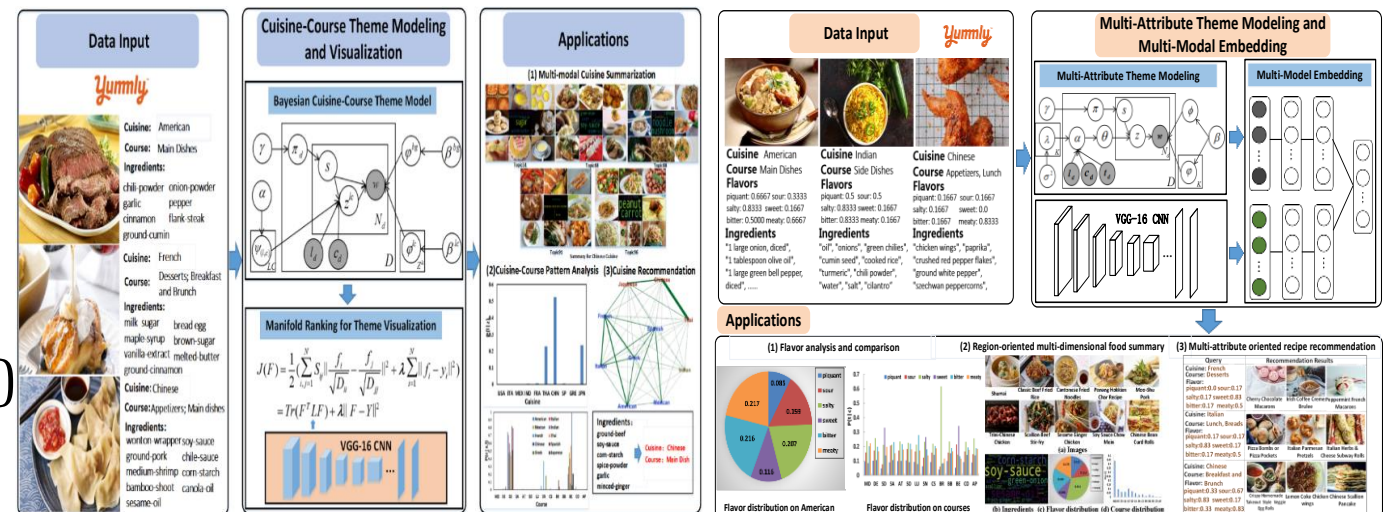
Part 4 Multimodal Recipe Analysis

Multimodal multi-attribute recipe modeling for recognition and retrieval

(Weiqing Min, *et al.* TMM'17)

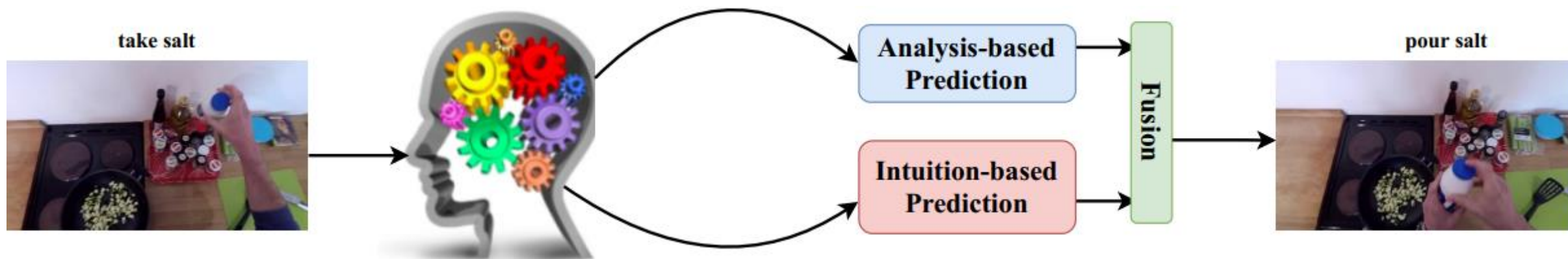**Multimodal multi-attribute recipe modeling for summary and recommendation**

(Weiqing Min, *et al.* ACM MM'17, TMM'18)

Part 5 Cooking Action Understanding

Egocentric Cooking Action Anticipation
(Tianyu Zhang, *et al.* ACM MM'20)

Tutorial Agenda

Event	Speaker	Time
Opening Remarks	Shuqiang Jiang	5minutes
Part 1: Food Computing	Shuqiang Jiang	10minutes
Part 2: Food Recognition	Weiqing Min	35minutes
Part 3: Food Retrieval & Recommendation	Weiqing Min	15minutes
Part 4: Multimodal Recipe Analysis	Weiqing Min	35minutes
Part 5: Cooking Action Understanding	Shuqiang Jiang	15minutes
Summary and Future Works	Shuqiang Jiang	5minutes

Tutorial website: http://123.57.42.89/FoodComputing_Tutorial_ACMMM2020.html