OPU at Recipe Search
-- Japanese Recipe Pairing
by Naïve Bayes Estimation --

Yasuhiro Tajima, Genichiro Kikui,
Megumi Kubota and Rikako Inoue
Okayama Prefectural University
Summary

Task: Japanese Recipe Pairing

Method: naïve Bayes based acquisition

- method1: use **major names** of ingredients
- method2: **original** ingredients’ names

Domain: given 100 sample data only

Evaluation: leave one out = 0%
- closed data set = 55% and 94%
Task description

Data sets:  100 Main dish and Side dish pair
Dish = Recipe : one record on Rakuten data

Query:  A main dish
Answer:  A side dish appropriate for the query

Dish = {name, list of ingredients, cooking steps..}
Application of naïve Bayes

A main dish: \( M(m_1, m_2, \cdots, m_i) \)
m_{l}, n_{k} : a name of ingredients

A side dish: \( N(n_1, n_2, \cdots, n_j) \)

Query: \( M \)

MAP estimation: find \( N : \max \ p(N | M) = \frac{1}{j} \prod_{k,l} p(n_k | m_l) \)

\( p(m_l | n_k) \) : co-occurrence

prior: \( p(n_k) = \frac{1}{j} \)

\[ p(n_k | m_l) = \frac{p(m_l | n_k) \cdot p(n_k)}{p(m_l)} \]
Method 1:

Use major names of ingredients
omit detailed description:

マスタード/粒  ⇒  マスタード
mustard/meal  ⇒  mustard

omit too rough class:

肉類/ぶた/こま切れ  ⇒  ぶた
meat/pork/small pieces  ⇒  pork
Method 2:

Use names of ingredients as it provided:
マスタード/粒
mustard/meal

肉類/ぶた/こま切れ
meat/pork/small pieces
Runs and results

Run1: method1 leave-one-out
   precision: 0.01
Run2: method1 closed(100 learning data)
   precision: 0.55
Run3: method2 leave-one-out
   precision: 0.00
Run4: method2 closed
   precision: 0.94
For the next step

• Using quantity of ingredients
• Using cooking process
• Evaluation by large data
• Data construction method