HOW PEOPLE MAKE PASTA IN EASTERN CULTURE

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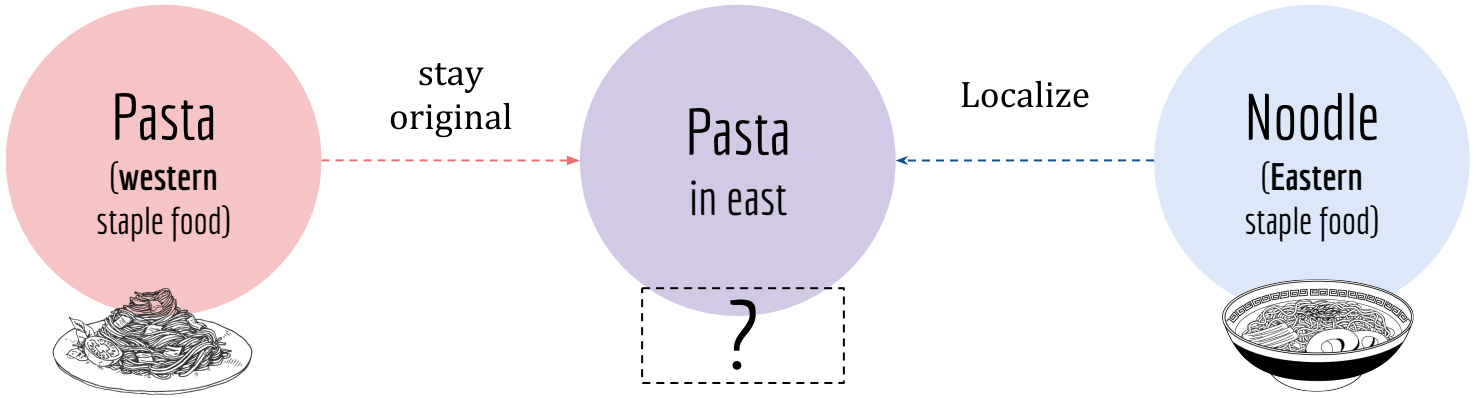
EAST
WEST

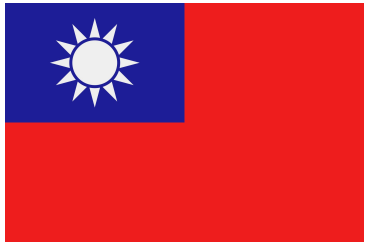
Pasta, as the most popular global food, is the food experiences influenced by local preference or it keep its original style ?



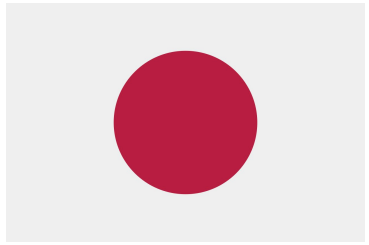
Based on 3 Countries

Italy

Taiwan



Japan



Discover 3 Food experiences

Ingredient network

Flavor network

Color network

Question

Ingredient network 	Whether pasta are made different in east and west according to the ingredients? - -
Flavor network 	Whether the taste preference of pasta change due to the preference of local staple food?
Color network 	Whether the visual preference of pasta change due to the preference of local staple food?

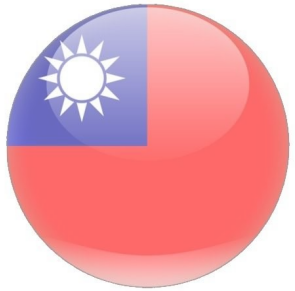
Ingredient Network – IP 7.1

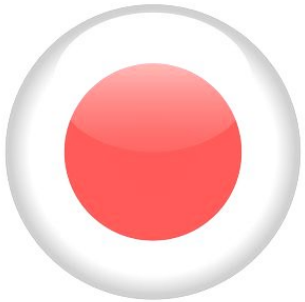
Elena Camuffo, Laura Crosara, Matteo Moro

Ingredients Network analysis - why?

The aim of our group is analyzing the ingredients that are used for pasta in three different countries: Italy, Taiwan and Japan, in order to give the following questions an answer:

Which are the most popular ingredients used for pasta in different cultures? Are these ingredients similar or different? How similar the eastern pasta is to western pasta vs. eastern noodle?





Data Collection

Ingredients

- 500 g (1,1 lb) of spaghetti
- 125 g (4,4 oz) of guanciale
- 400 g (14 oz) of canned San Marzano tomatoes
- 80 g (3 oz) of grated Pecorino Romano cheese
- 1 red pepper
- 50 ml dry white wine (optional)
- fine and coarse salt

材料 (1人分)

パスタ	100g
茗荷	1個
生姜	1片
わかめ（乾燥）	大さじ1
昆布茶	小さじ1

食材

橄欖油	適量	義大利麵	一份
牛肉	100g	洋蔥	1/4顆
大蒜	3顆	蘑菇	5顆
胡蘿蔔	少許	松露醬	適量

Beautiful Soup

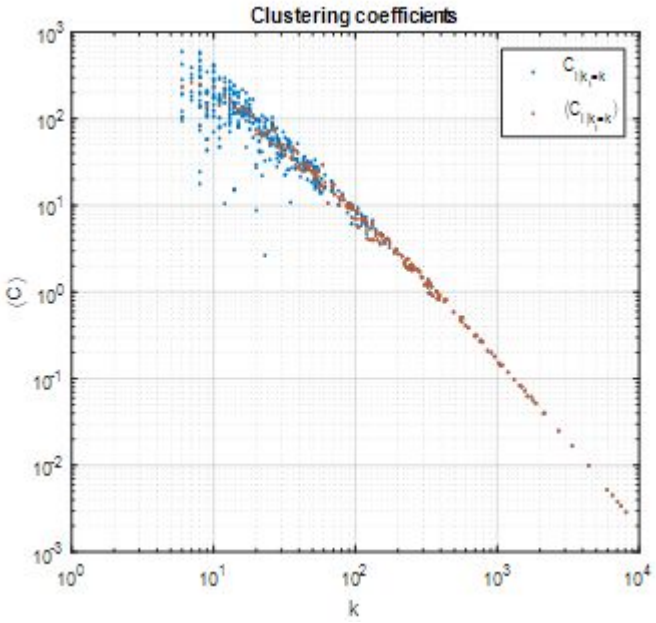
python

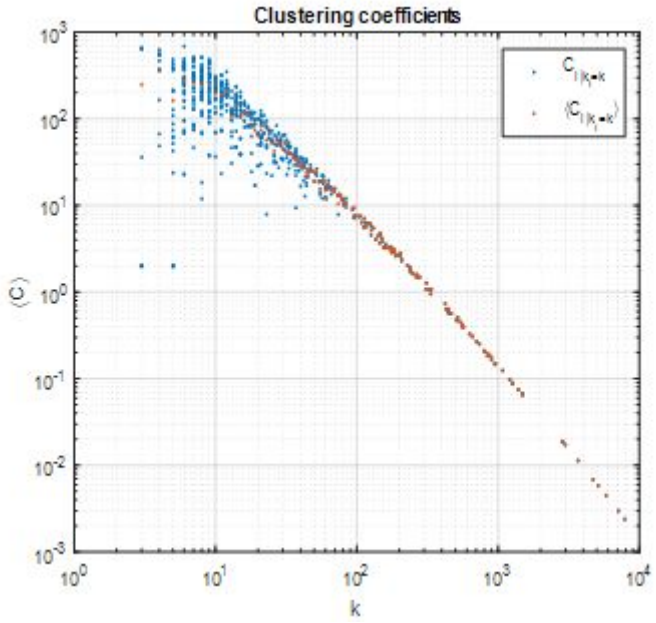
Analysis Results - projected network

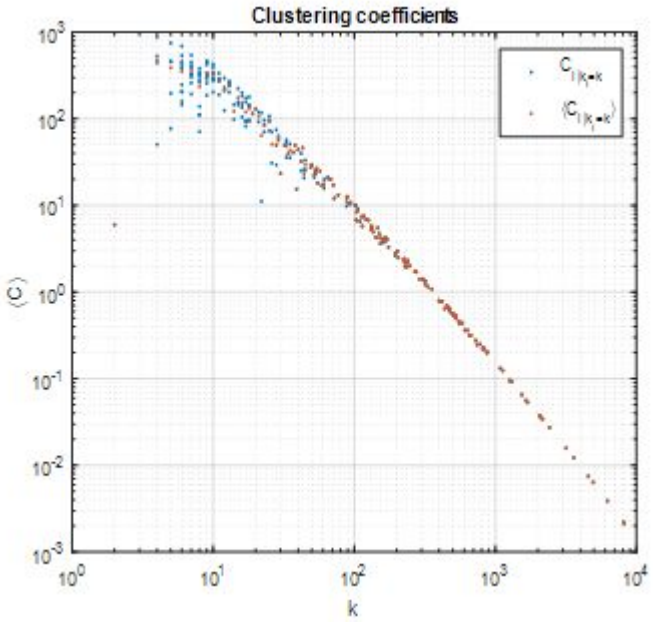
	Italy	Taiwan	Japan
Number of nodes N	500	659	257
Number of links L	22790	21334	11038

			
Average Distance	2.1389	inf (2.1778)	2.1625
Diameter	5	Inf (5)	5
Average degree	199.6295	138.1487	343.3074
γ	1.8134	1.7334	1.7059

Clustering Coefficients - projected network





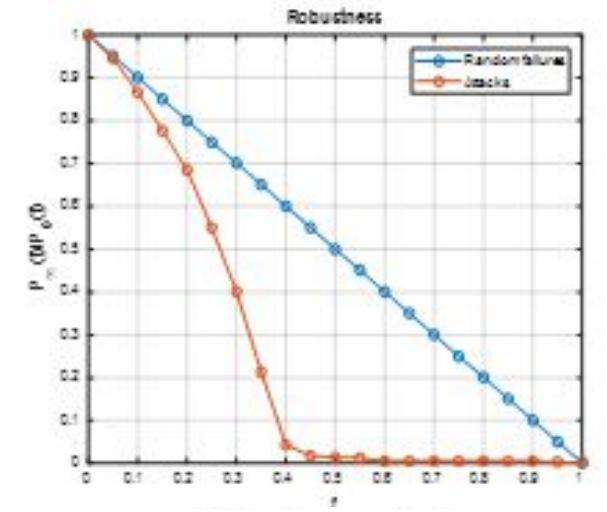


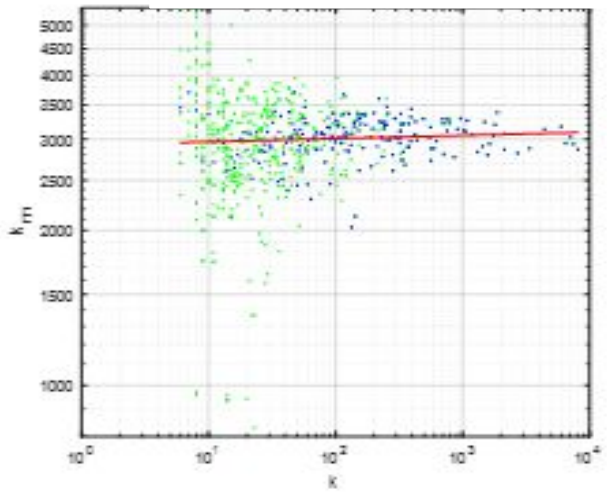
ITALY

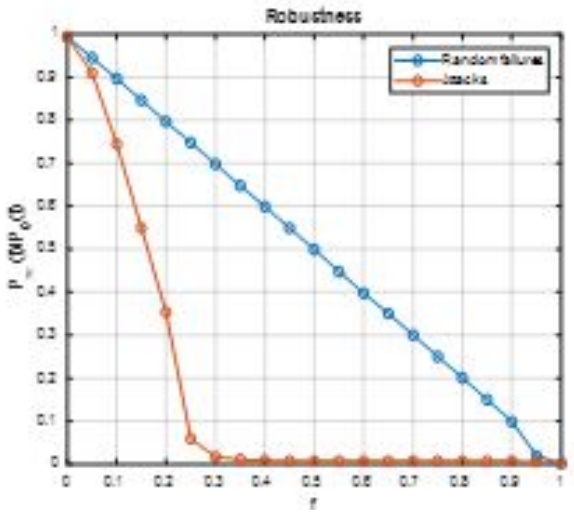
TAIWAN

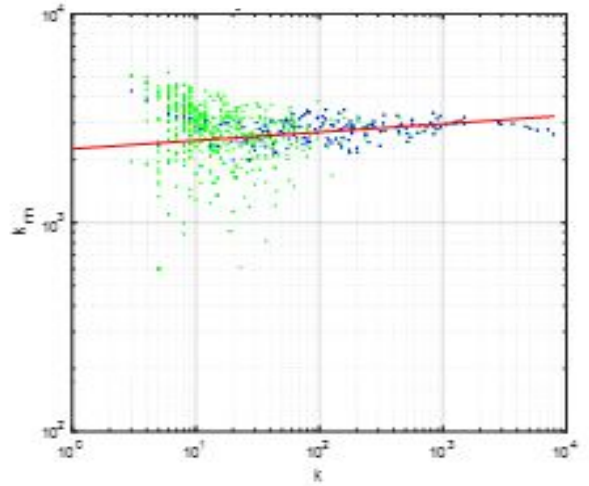
JAPAN

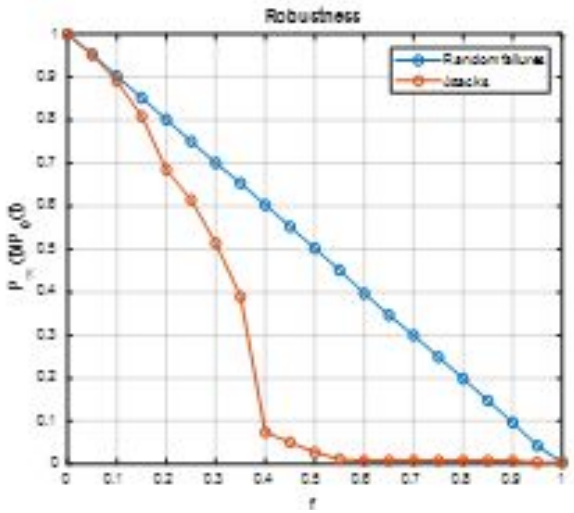
Robustness & Assortativity - projected network

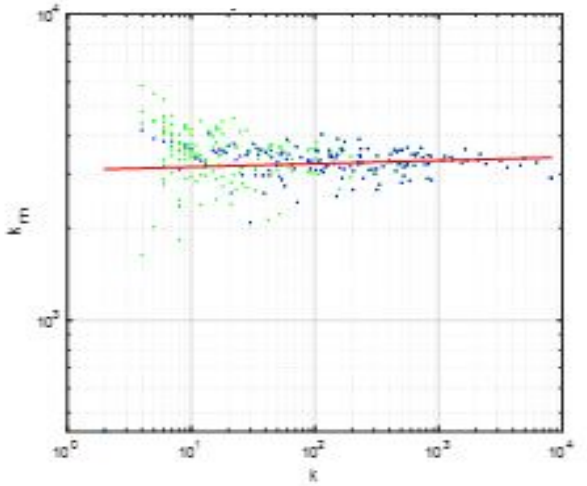












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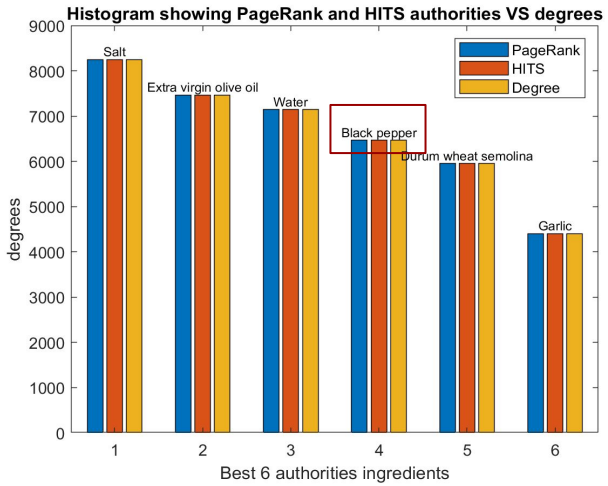
Ranking - projected network



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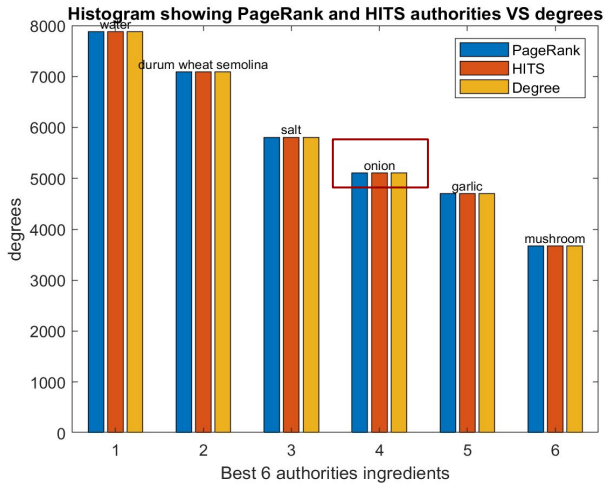

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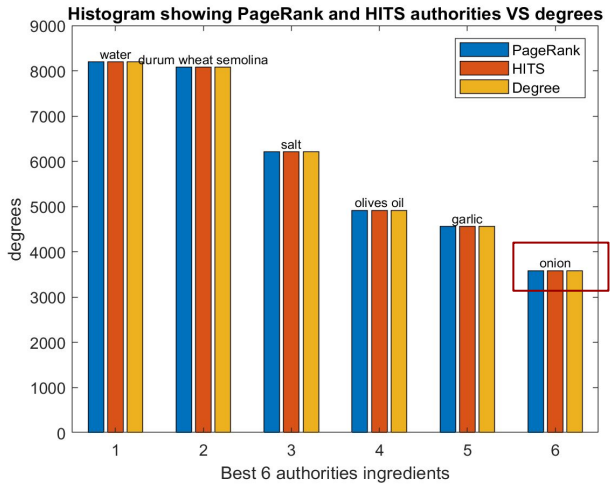

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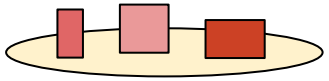
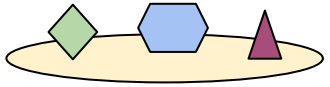
WESTERN HUBS:
pepper

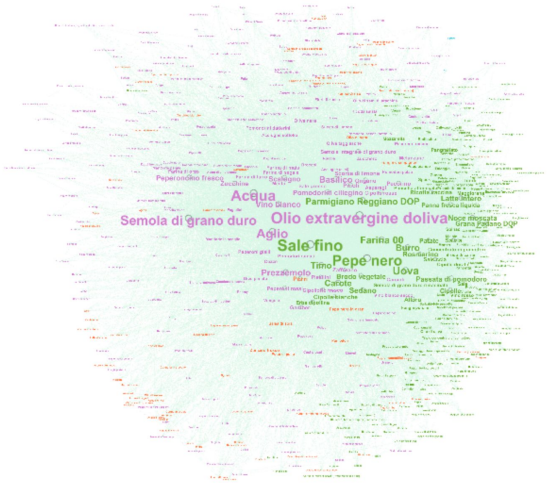
IN COMMON:
Salt
Olive Oil
Water
Semolina
Garlic

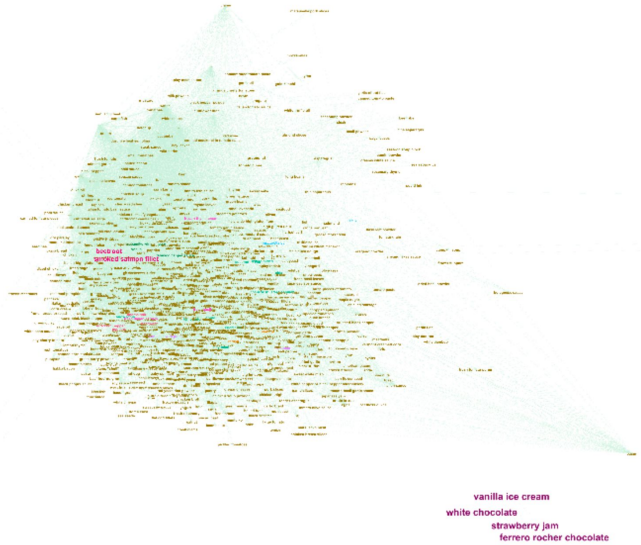
EASTERN HUBS:
onion
mushrooms

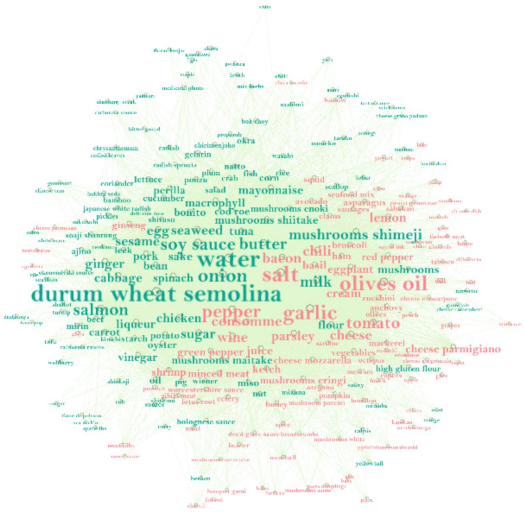


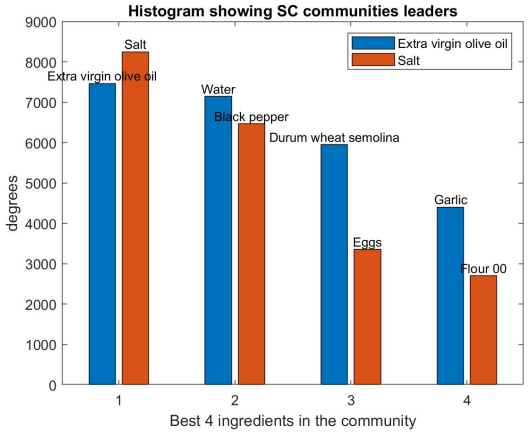


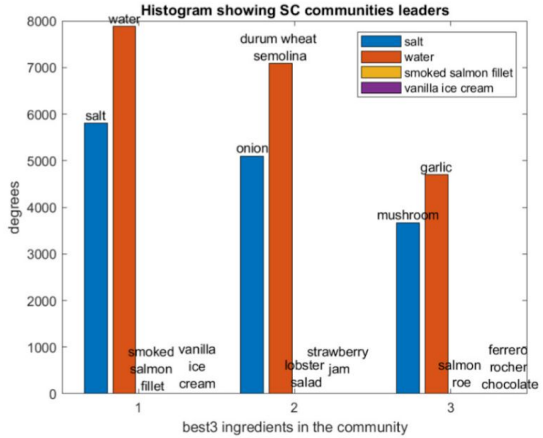
Communities - projected network

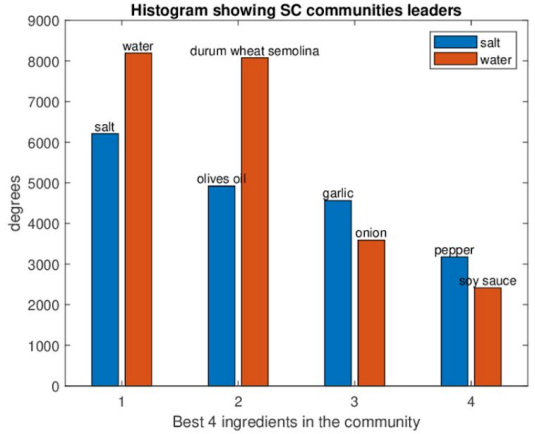












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Link Prediction - projected network

pairings		CN	AA	RA	KA	LP	RW
Nutmeg	Fresh chilli	x			x	x	
Liquid fresh cream	Carrots	x			x	x	
Tomato sauce	Pine nuts	x			x	x	
Butter	Mussels	x			x	x	
Salt	Nduja						x
Pig cheek	Pumpkin		x				
Pig cheek	Ricotta cheese	x					
Sausage	Pecorino			x			
Whole milk	Beans			x			
Whole milk	Onions golden		x		x	x	

ITALY

pairings		CN	AA	RA	KA	LP	RW
fresh cream	chili	x		x	x	x	
black pepper	potato	x					
spices	bacon	x			x	x	
carrots	nuts		x				
canned tomatoes	pesto	x			x	x	
carrots	pesto		x				
salt	pig cheek						x
lemon juice	chicken broth		x				
rosemary	chicken broth			x			
fresh cream	sugar	x		x	x	x	

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pairings		CN	AA	RA	KA	LP	RW
cheese	sesame	x			x	x	
macrophyll	bean			x			
salt	sweet sauce		x				x
cabbage	lemon			x			
lemon	mushrooms maitake			x			
chicken	vegetables			x			
cabbage	cheese parmigiano			x			
consomme	perilla	x			x	x	
egg	lemon	x		x	x	x	
bacon	vinegar	x			x	x	

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Link prediction - Bipartite network

New Ingredient	Recipe
Black pepper	Durum wheat semolina, Water, Ricotta salata, Eggplant, Garlic, Vine-ripened tomatoes, Basil, Salt, Extra virgin olive oil
Vegetable broth	Semolina durum whole wheat, Water, Fresh onion, Mushrooms, Bacon, Cannellini beans, Rosemary, Extra virgin olive oil, Black pepper, Salt
apple	onion, anchovies, water, olive oil
Brandy	Chicken breast, Noodles, Potatoes, Snow peas, Carrots, Celery, Mushrooms, Leeks, Water, Fresh ginger, Parsley, Extra virgin olive oil, Black pepper, Salt
Almonds	streaky pork, durum wheat semolina, water, minced garlic, plum, cauliflower, mushroom, soft-boiled eggs, rice wine, salt, flour

ITALY

New Ingredient	Recipe
mushroom	onion, meat, red wine, concentrated tomato paste, chicken broth, bay leaves, sugar, salt, durum wheat semolina, water, cheese, fresh thyme, black pepper
chia	streaky pork, durum wheat semolina, water, minced garlic, plum, cauliflower, mushroom, soft-boiled eggs, rice wine, salt, flour
cheese	durum wheat semolina, water, bacon, asparagus, shrimp, garlic, black pepper, rose salt, paprika, parsley leaf, cheese
basil leaves	durum wheat semolina, water, onion, cream, chicken breast, squid
avocado	durum wheat semolina, water, bacon, large tomatoes, green pepper, mushroom, cheese, ketchup, salt, black pepper

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New Ingredient	Recipe
consomme	durum wheat semolina, water, salmon, olives oil
tomato	onion, bacon, garlic, olives oil, cream, salt, cheese, durum wheat semolina, water, juice, nut
soy sauce	chicken, salt, durum wheat semolina, water, avocado, clams, mayonnaise, onion, cod roe
onion	durum wheat semolina, water, saury, salt
pepper	durum wheat semolina, water, salmon, olives oil

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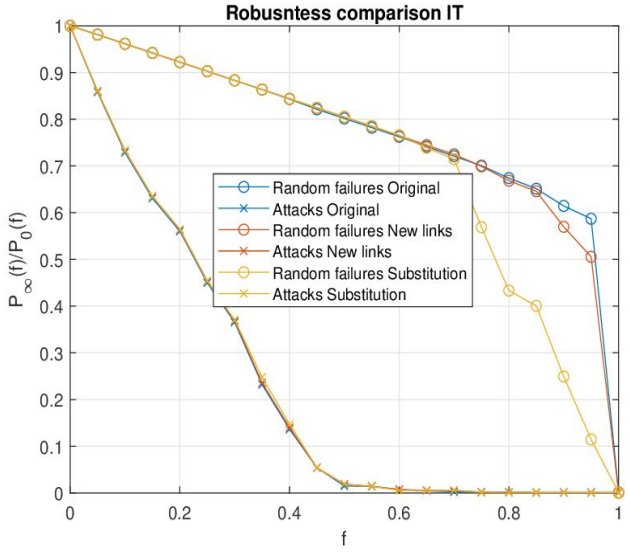
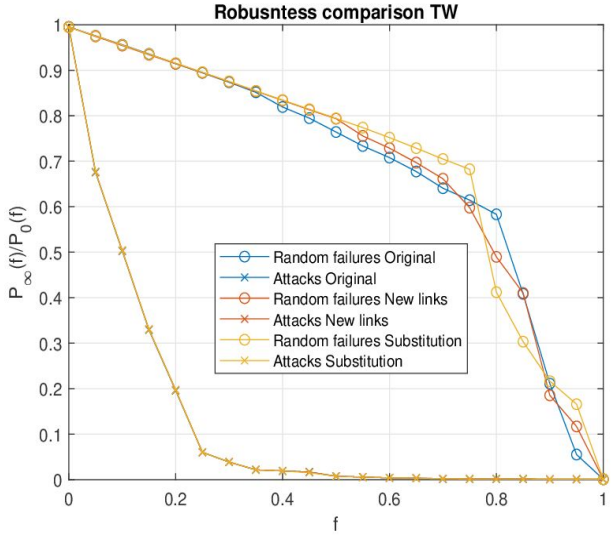
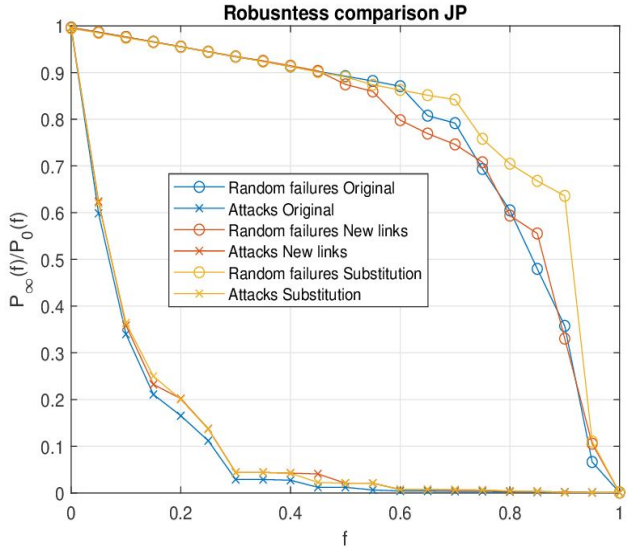
Robustness of new links







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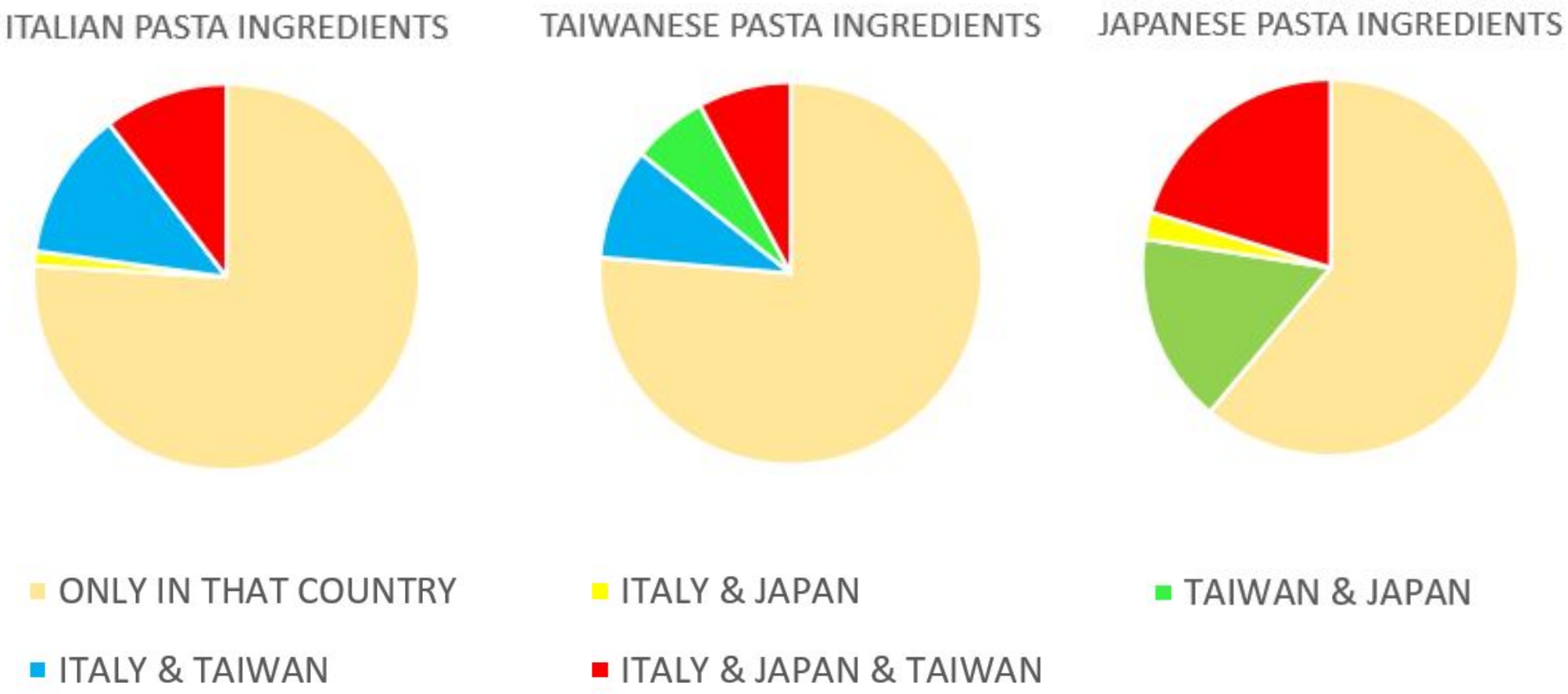
''basil' -> 'lemongrass'
'black pepper' -> 'soy sauce'

'black pepper' -> 'aivar'

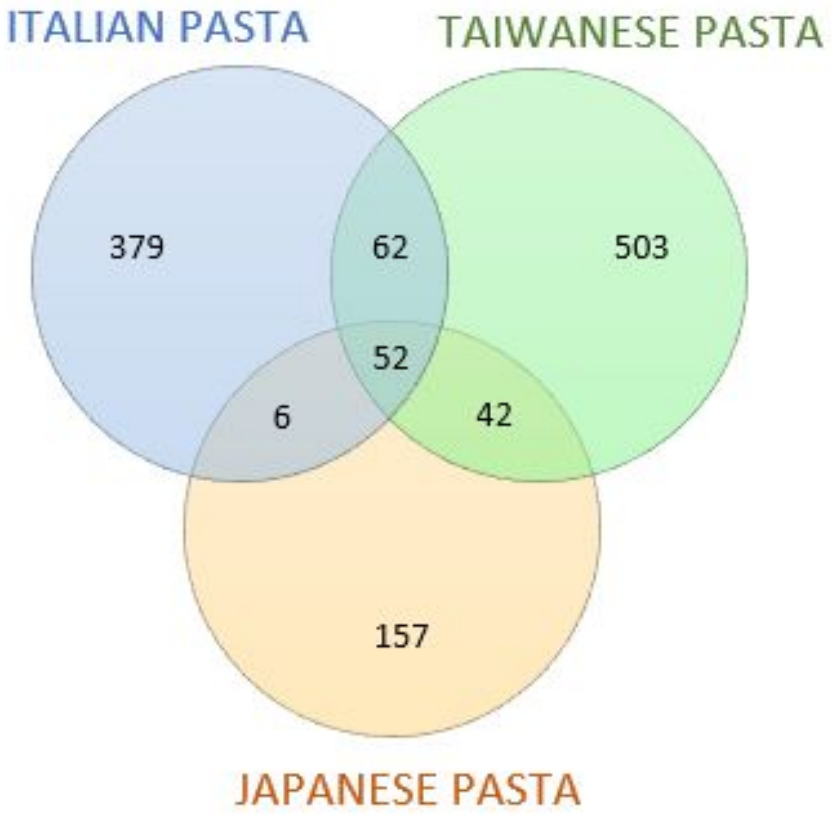
'mushrooms' -> 'nuts'
'tomato' -> 'potesara' (potato sald)

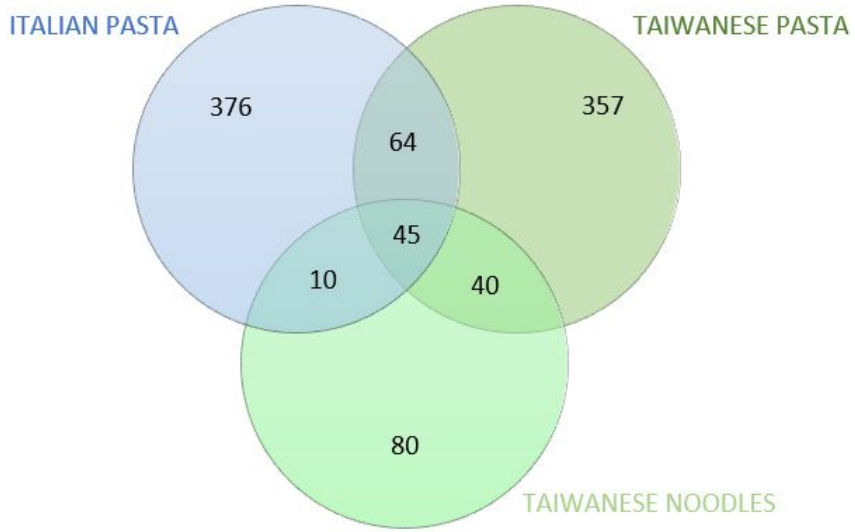
We can make substitutions!

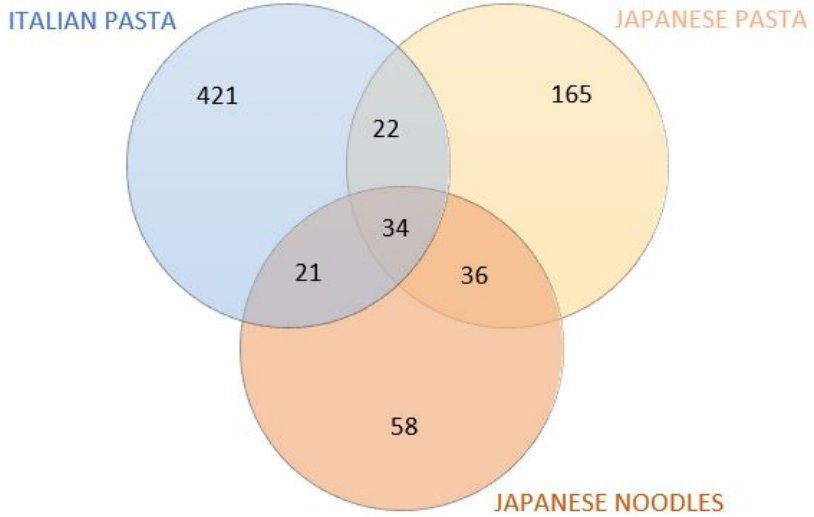
CONCLUSIONS - pasta networks



CONCLUSIONS - pasta & noodles







Flavor Network – IP 7.2

Federico Fiorenzoli, Aniello Xie

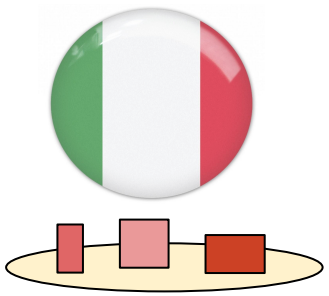
Flavor Analysis - Why?

Starting from this hypothesis:

“Westerns tend to use ingredients that share flavors to cook while Easterns avoid foods that share the same flavors in their dishes”

Q1

Does pasta dishes follow this hypothesis?

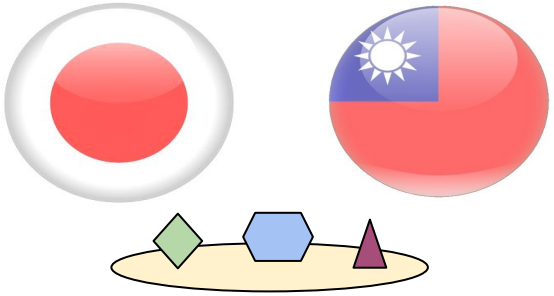


Q2

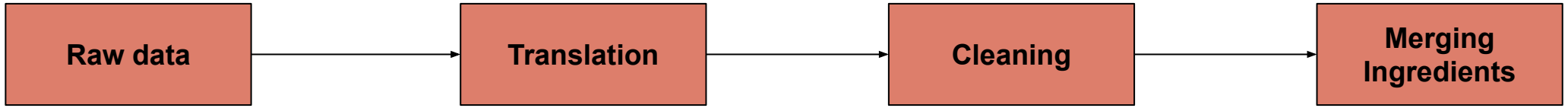
How similar are the eastern pastas with the Italian ones?

Q3

How similar are eastern pastas respect eastern noodles?



Data Scraping 1



☆理想の和風パスタ
-パスタ♪
-本つゆ
-★醤油
-オリーブオイル
-ツナ缶

☆Ideal of Japanese-style pasta
-pasta♪
-this rainy season
-★soy sauce
-olive oil
-a can of tuna

Ideal of Japanese-style pasta
-pasta

-soy sauce
-olive oil
-a can of tuna

Ideal of Japanese-style pasta
-pasta

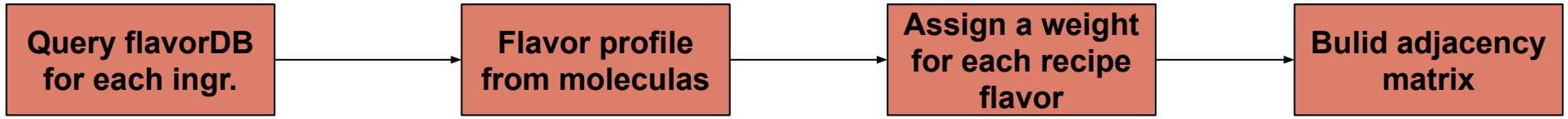
-soy sauce
-oil
-tuna

Beautiful Soup

python

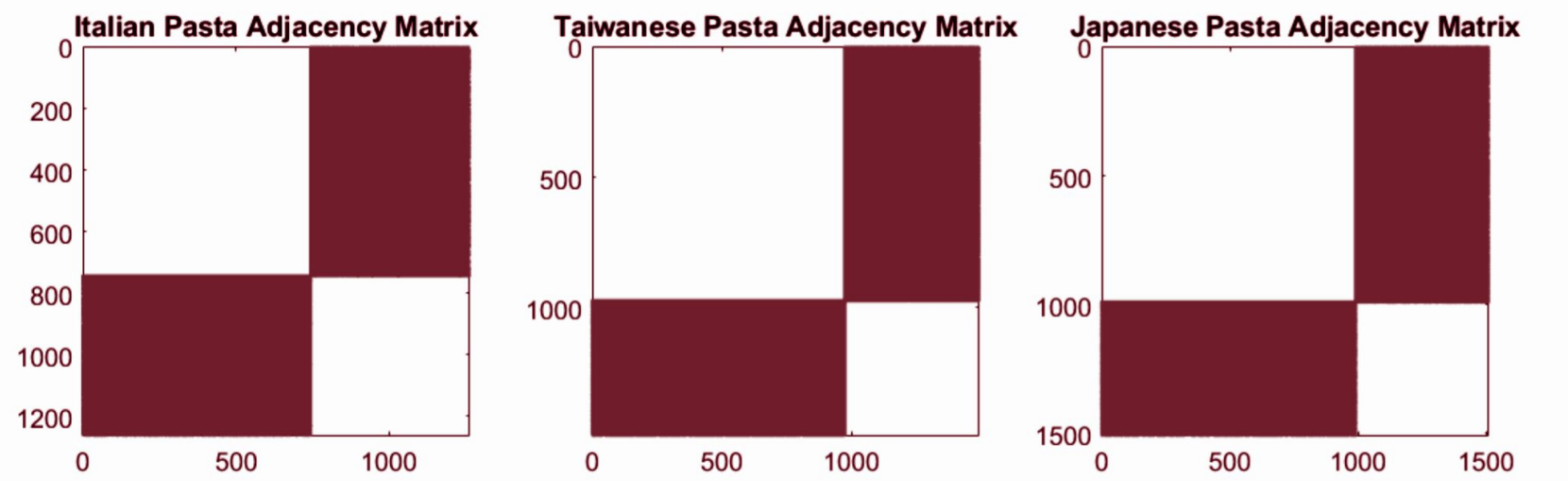
5 dataset * <1000 recipes> * <5 ingredients>

Data Scraping 2

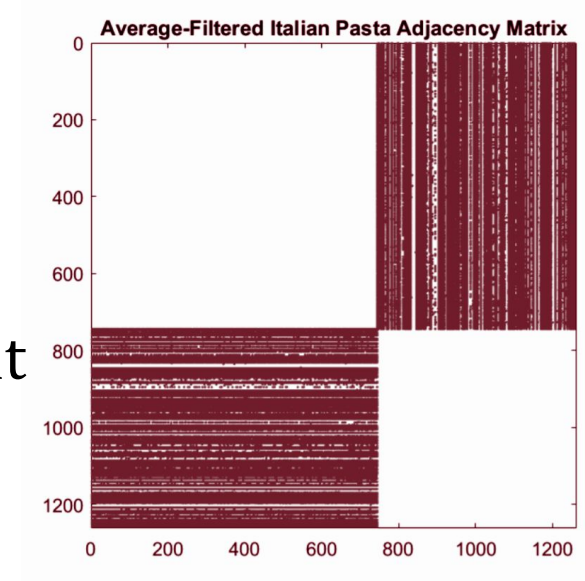


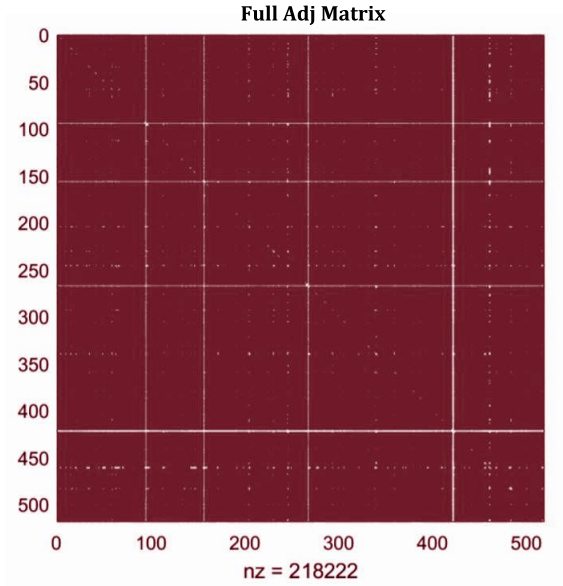
(+)-Delta-Cadinene	herbal, woody, thyme, wood, medicine, dry
(+)-Neomenthol	camphoraceous, minty, sweet, mentholic
(-)-Epicatechin	bitter
(-)-Epicatechin Gallate	bitter
(-)-Epigallocatechin	bitter
(-)-Epigallocatechin Gallate	bitter
(2E,4E)-Deca-2,4-Dienal	citrus, orange, nut, wax, meat, fat, fresh, fatty, oily, cucumber, sweet, melon, pumpkin, fried, green
(E)-Hept-2-Enal	soap, vegetable, fat, fresh, fatty, pungent, almond, green

Adjacency Matrix

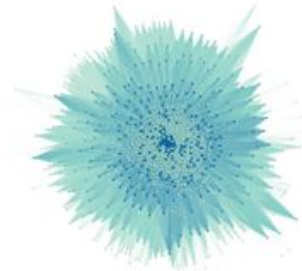


- Almost fully connected bipartite adjacency matrices
- Low link weight
- One big community with default Gephi function



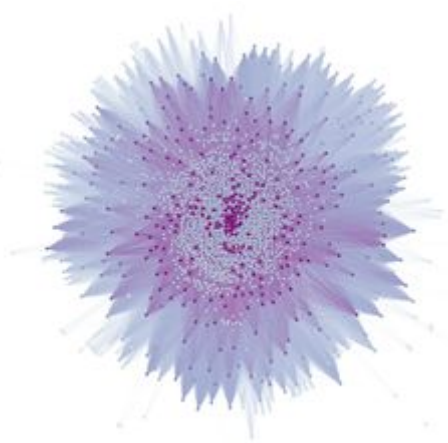


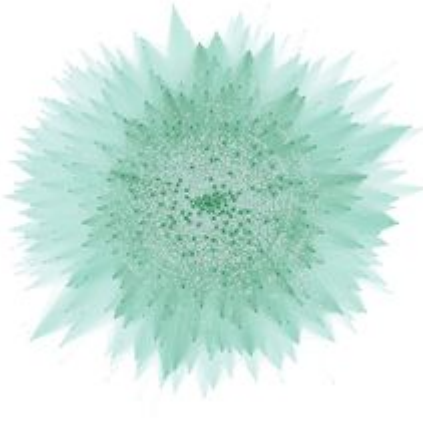
Pasta Flavor Network -Bipartite


Average Degree	357	416	409
Av. Weighted Degree	2704	4096	3804
Average Link Weight	4.2913	6.0503	5.5562
Network Diameter	4	4	4
Average Path Length	1.903	1.902	1.907
ɣ	2.5281	2.2676	2.3516

Noodles Flavor Network - Bipartite



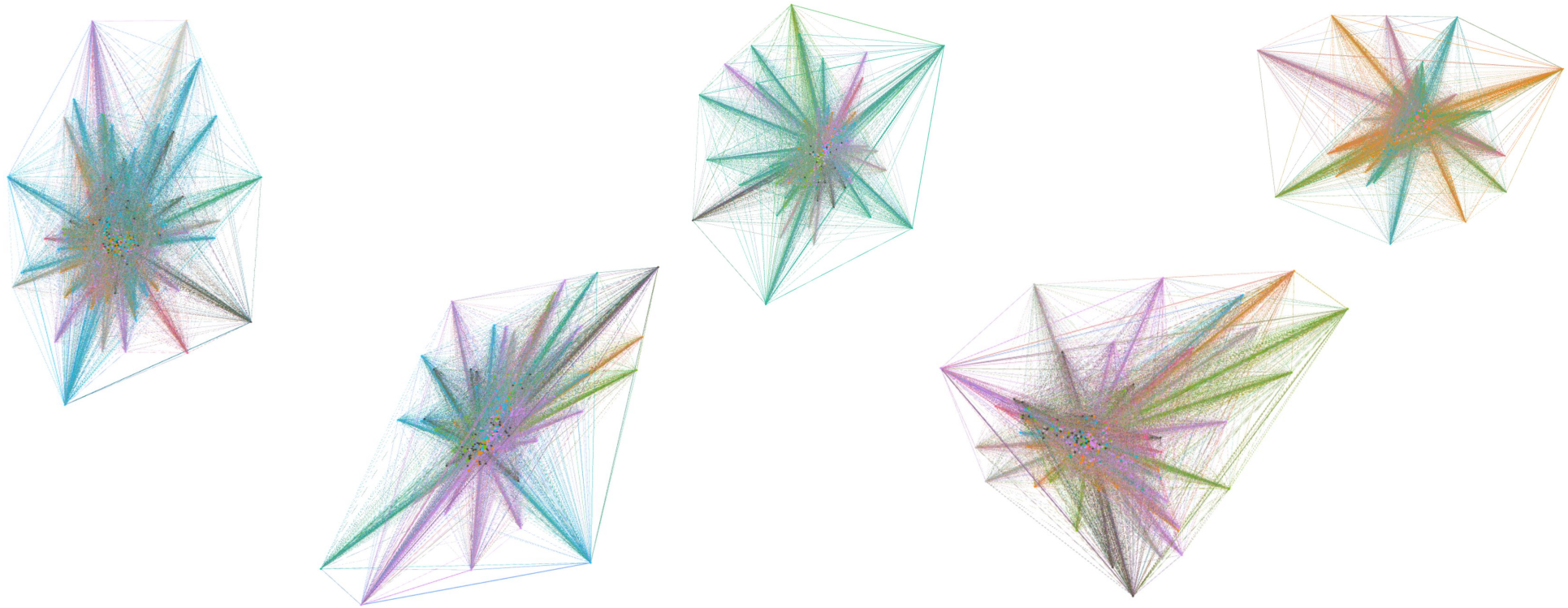


Average Degree	405	469
Av. Weighted Degree	2853	2730
Average Link Weight	7.8522	5.9958
Network Diameter	4	4
Average Path Length	1.941	1.985
ɣ	2.6776	2.1871

Flavour Network Community

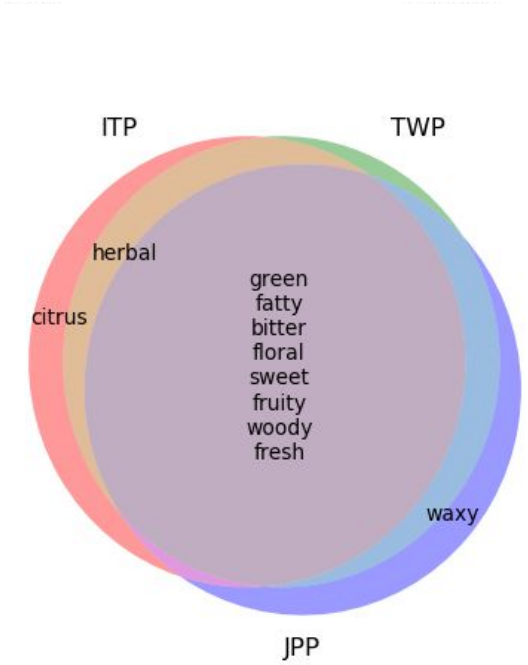
Resolution = 1.0 → No communities

Resolution = 0.8 → FIREWORKS!



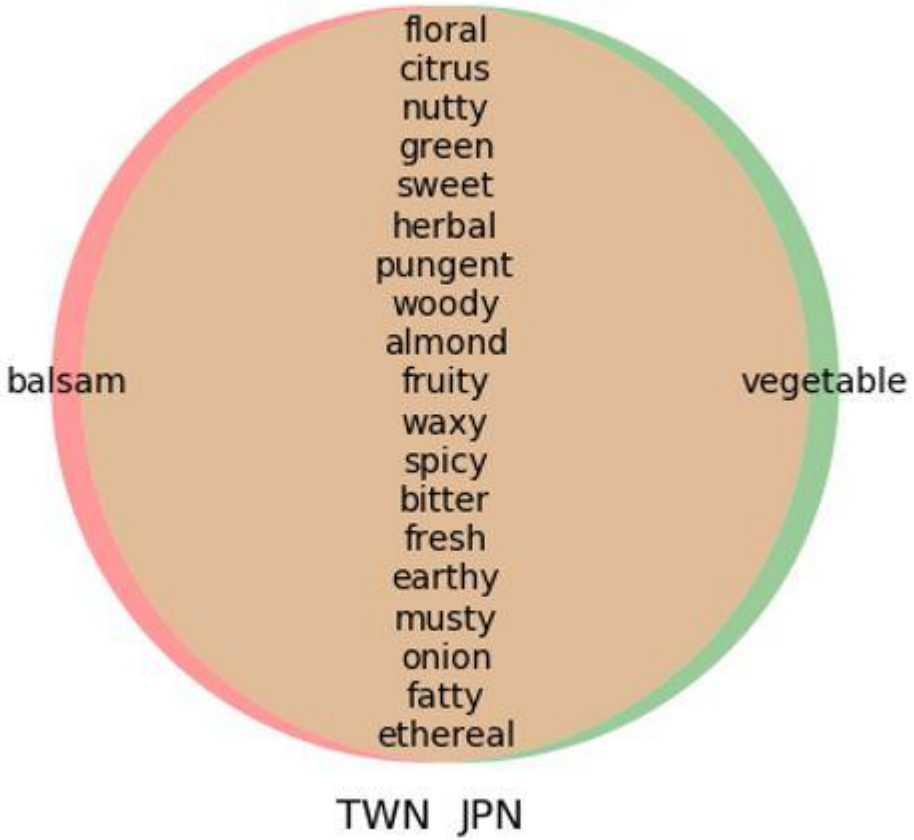
Only interesting thing: TOP5 FLAVOURS ARE ALMOST IN DIFFERENT CLUSTERS

Which are the most common flavours in the pasta dishes?



Ranking	Italian P.	Taiwanese P.	Japanese P.
01	sweet	sweet	sweet
02	green	green	green
03	bitter	fruity	bitter
04	fruity	bitter	fruity
05	woody	woody	floral
06	herbal	floral	fatty
07	floral	fatty	fresh
08	citrus	nutty	woody
09	fresh	herbal	nutty
10	fatty	fresh	waxy

... Does noodle dishes follow the same behaviour?



Ranking	Taiwanese N.	Japanese N.
01	sweet	sweet
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04	bitter	fruity
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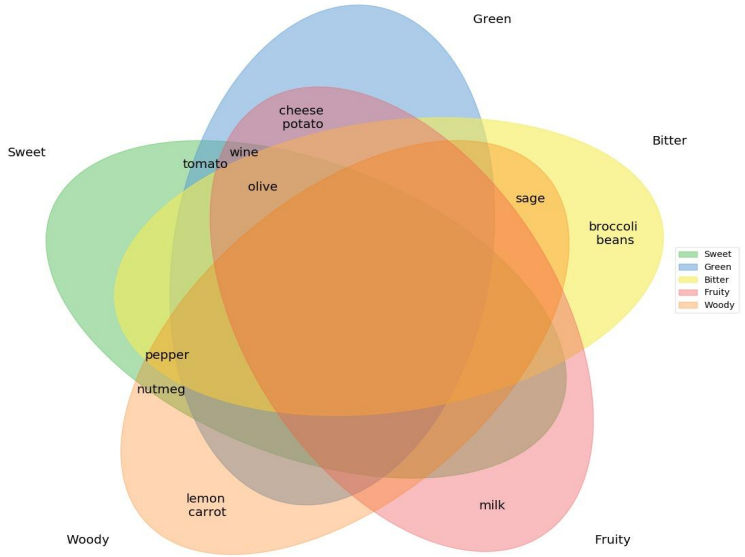
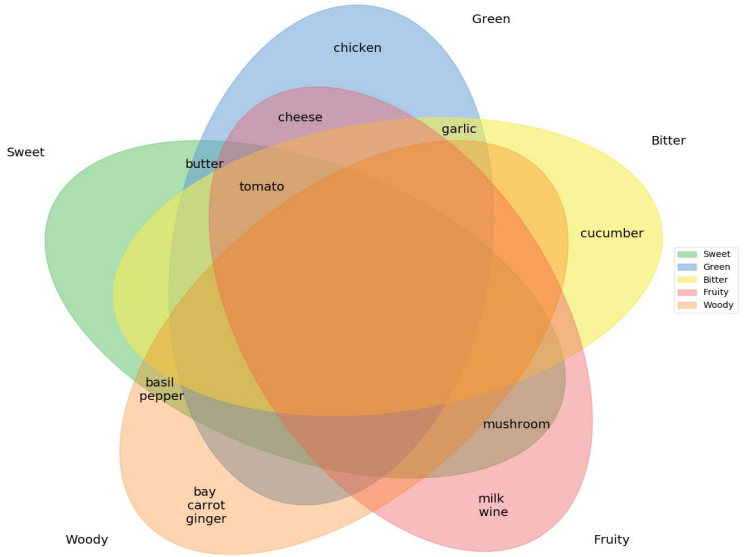
06	floral	fatty
07	fatty	fresh
08	nutty	woody
09	herbal	nutty
10	fresh	waxy

Reverse Flavor Analysis

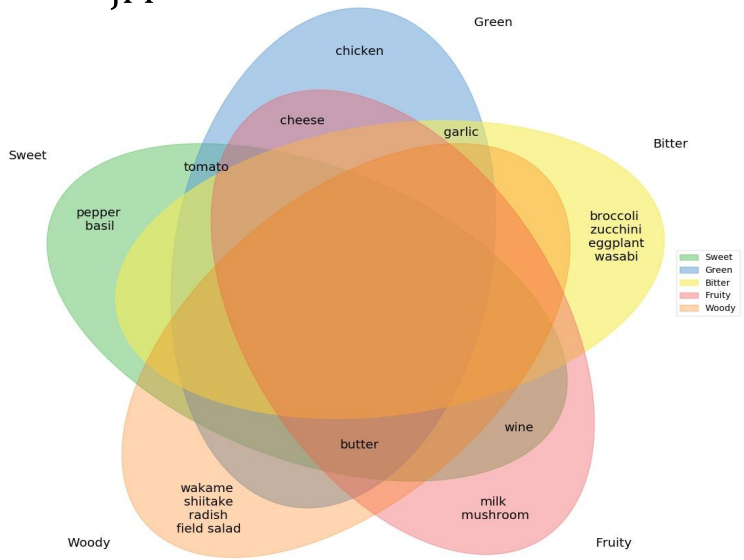
ITP



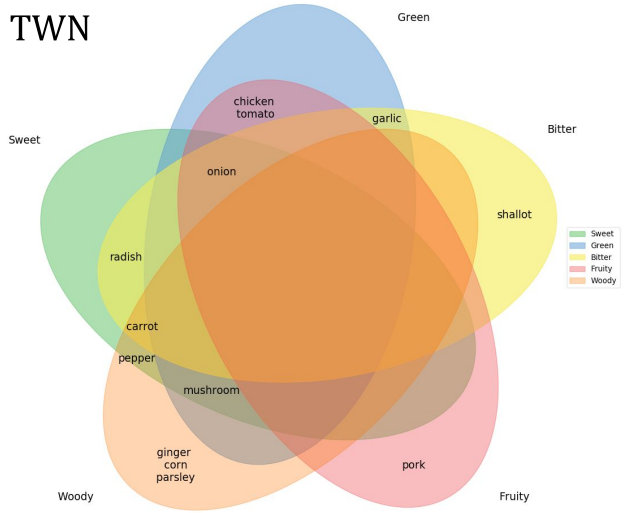
TWP



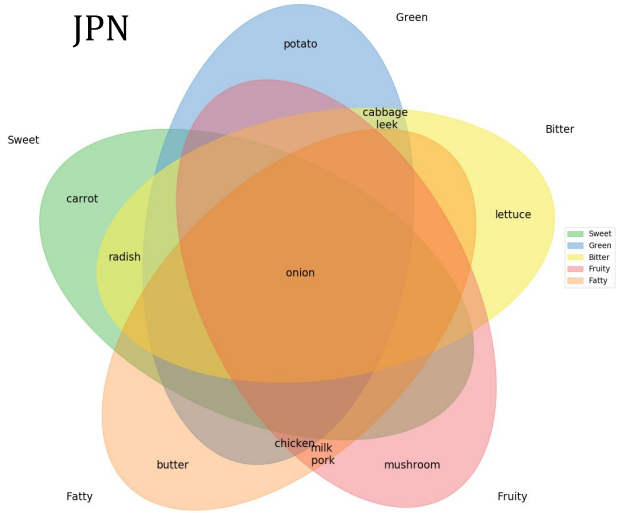
JPP



TWN



JPN



Hypothesis result

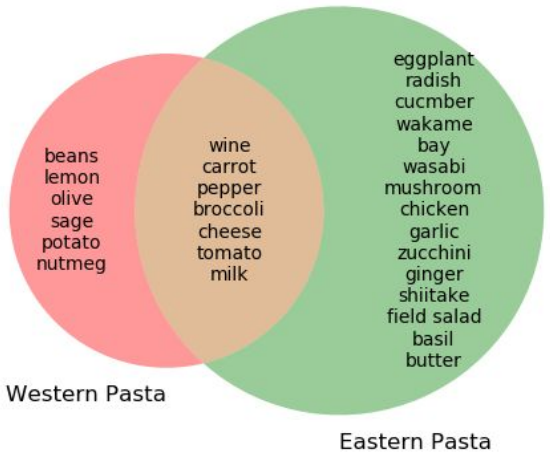
Recalling our initial hypothesis:

"Westerns tend to use ingredients that share flavors to cook while Easterns avoid foods that share the same flavors in their dishes"

WHAT WE HAVE DISCOVERED

In general Eastern pasta are more rich and tasty than Italians

"Pasta Localization Effect"



...but is also true that filtering appropriately the flavours eastern pasta uses more ingredients than western

Color Network – IP 7.3

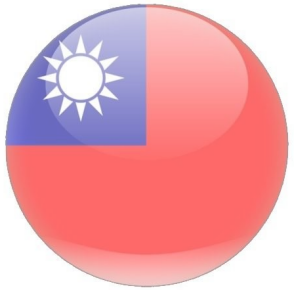
Giovanni Colotti, Daniele Lorenzi

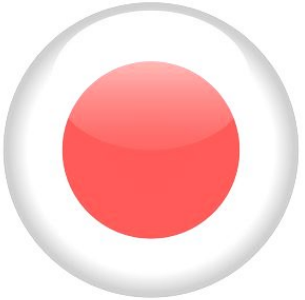
Why analyze recipe colors?

We decided to use this different approach to try to find if different cultures have a preference for certain colors and to also see if it it is possible to divide the recipes in the 3 nations just by their colors

Which colors are more prevalent in the different cultures?

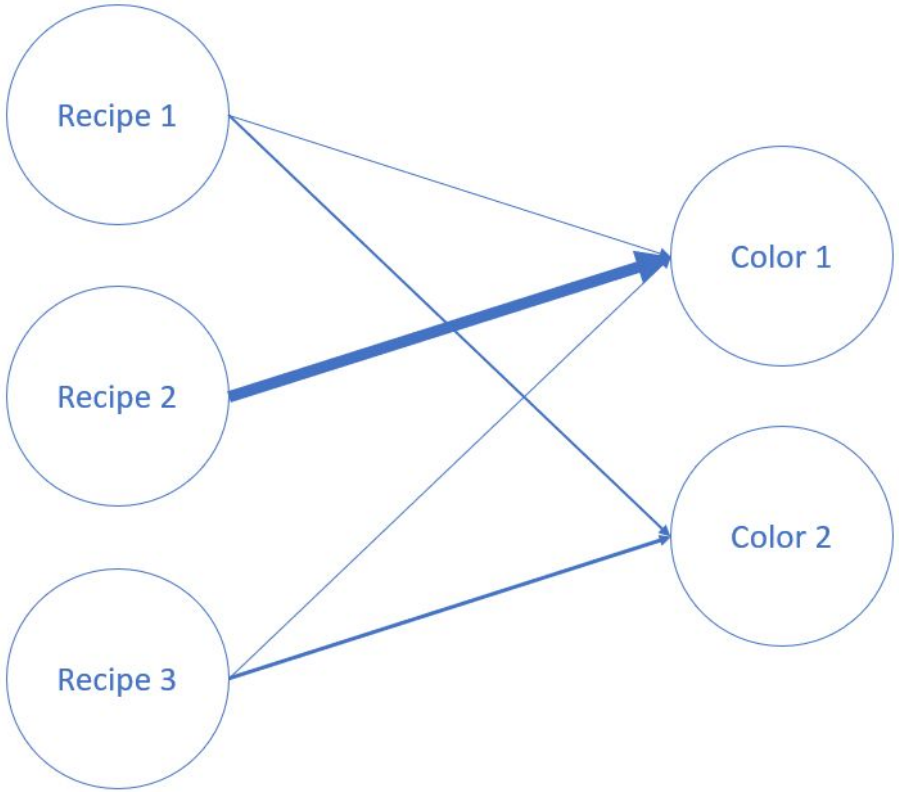
Is it possible to find the nationality of a recipe by its colors?



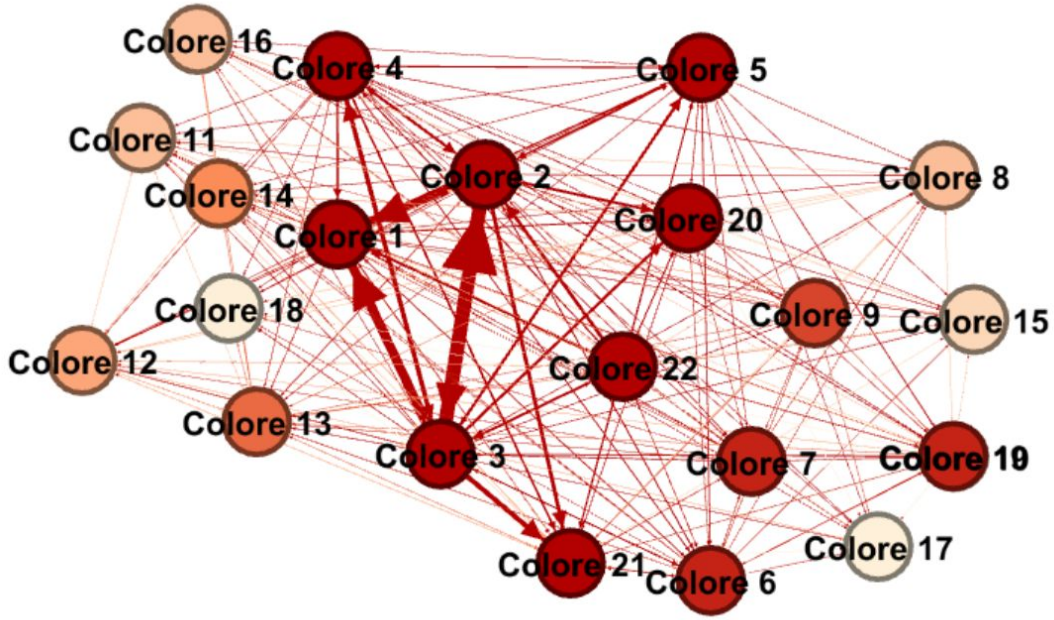


Colors-Recipes Networks

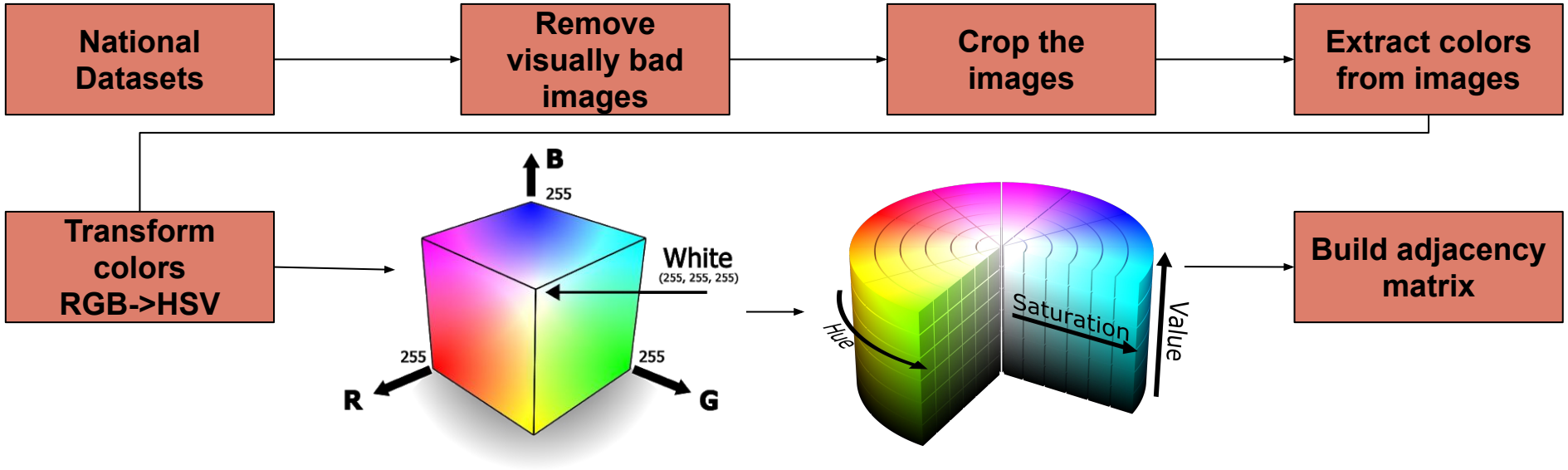
Bipartite networks:
colors and recipes



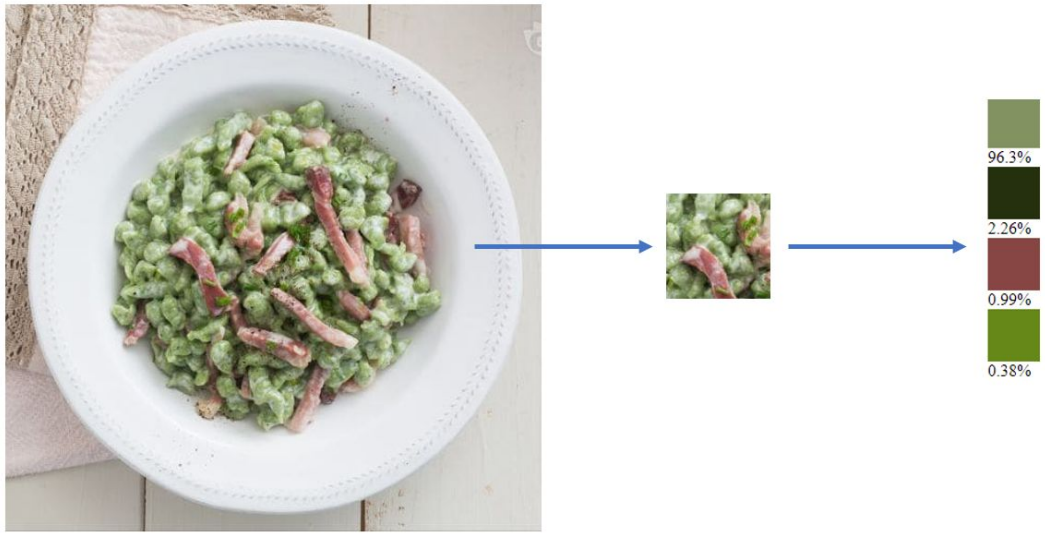
Projections of the networks



Color processing and color spaces

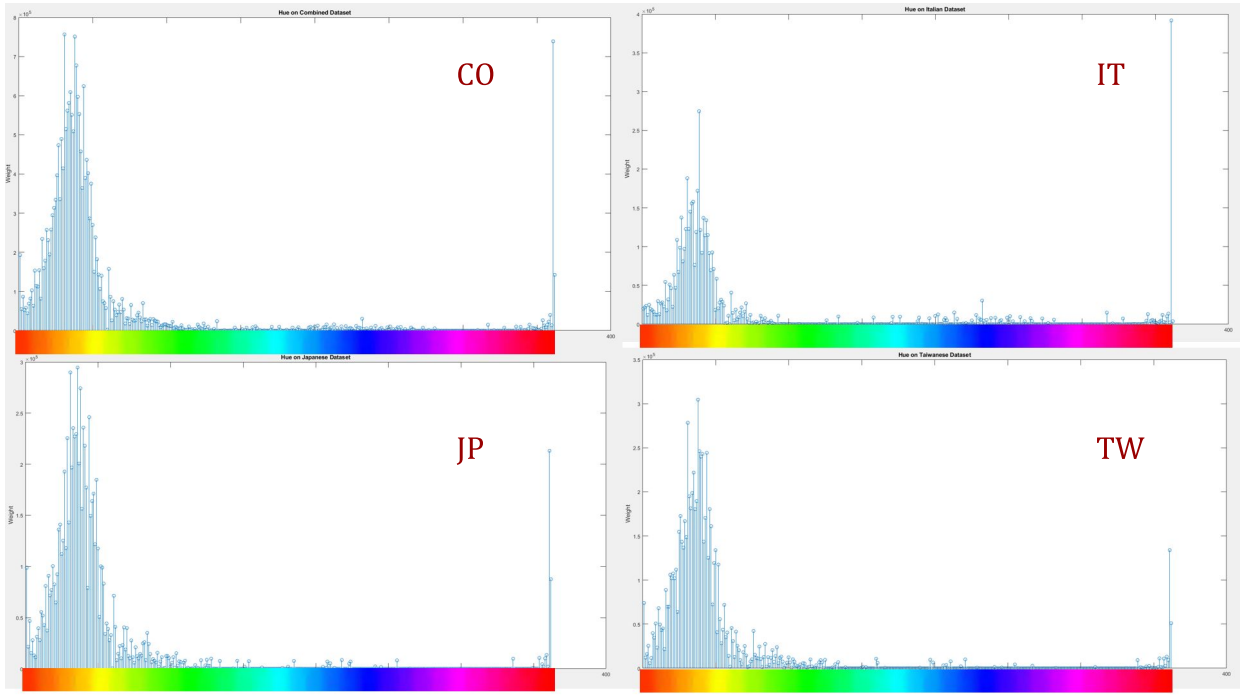


python™



Color distributions

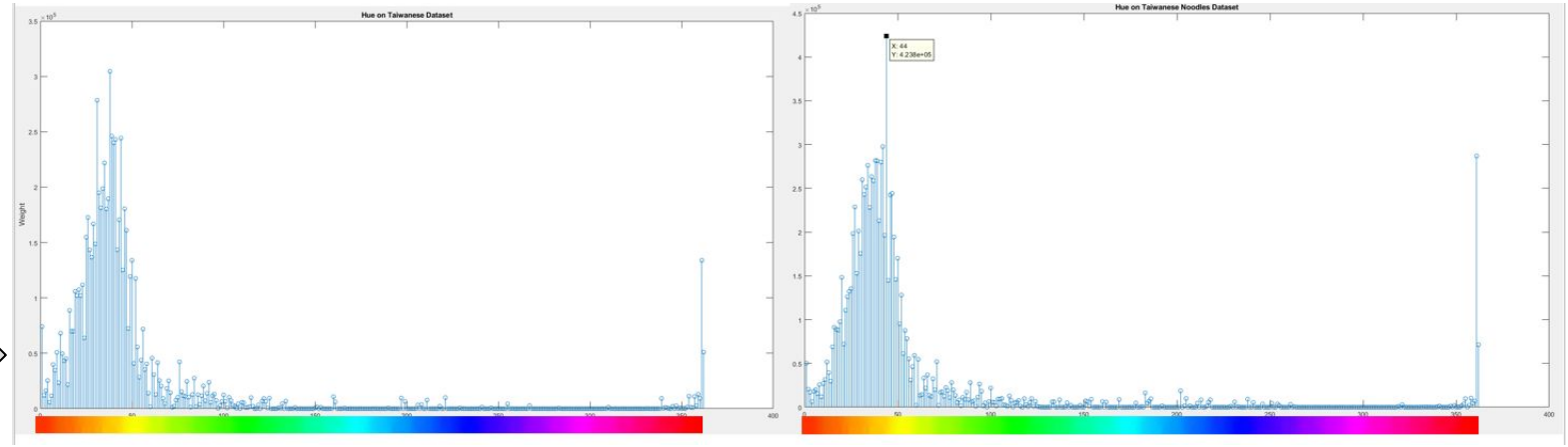
Pasta networks



The color are distributed exactly in the same way, with minor differences NOT possible to distinguish between nations

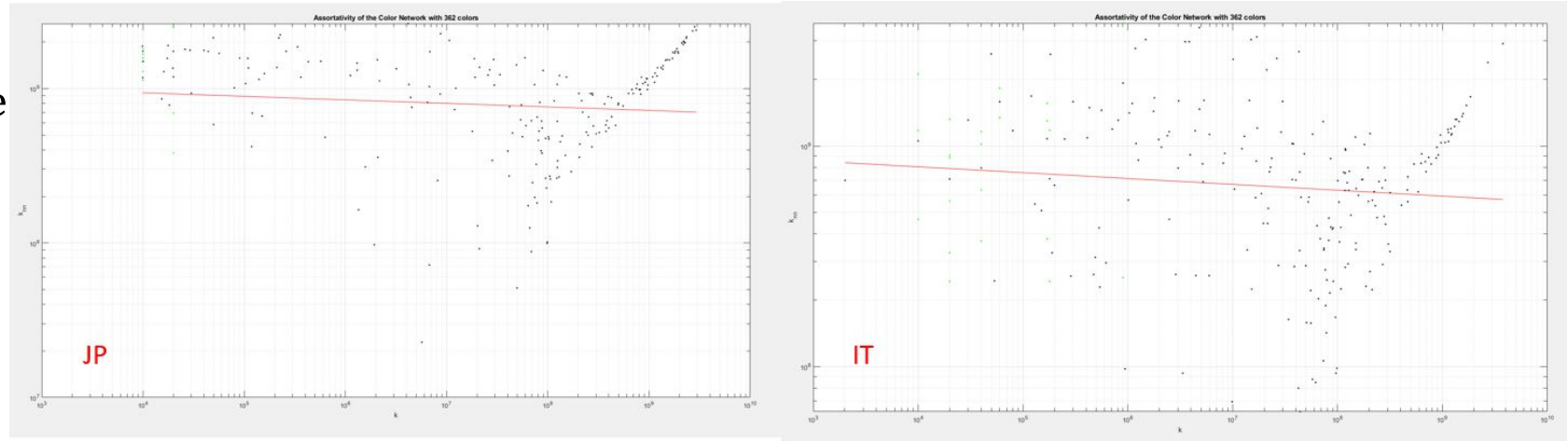
Pasta vs Noodles

The noodles colors are shifted to the right, noodles recipes are “more yellow”

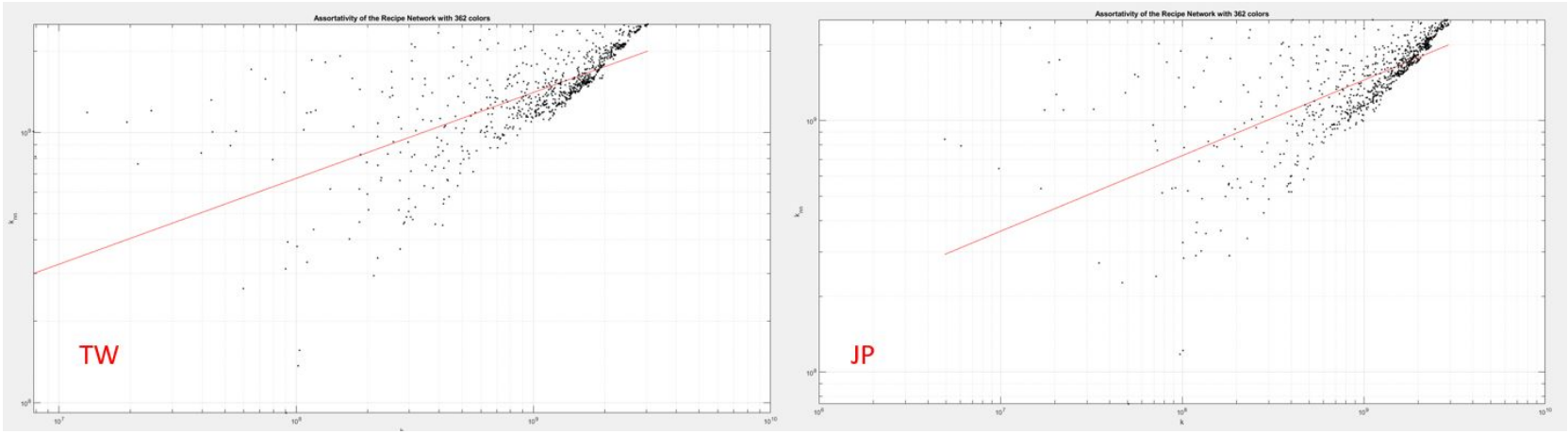


Assortativity on the recipes and colors networks

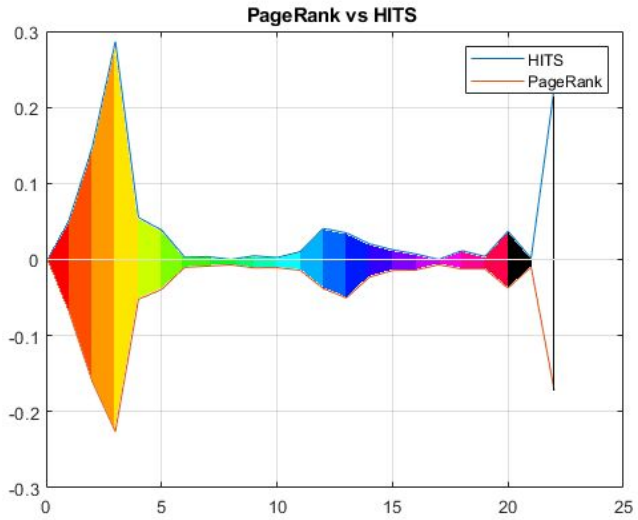
The colors form a neutral to disassortative network, the main colors (yellow, orange) do not connect together often

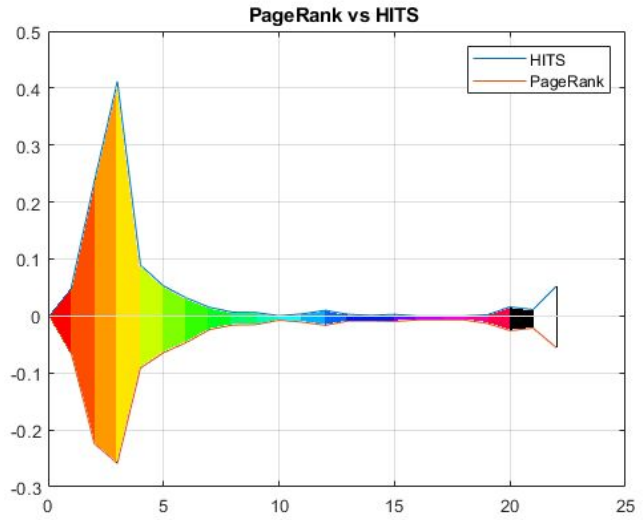


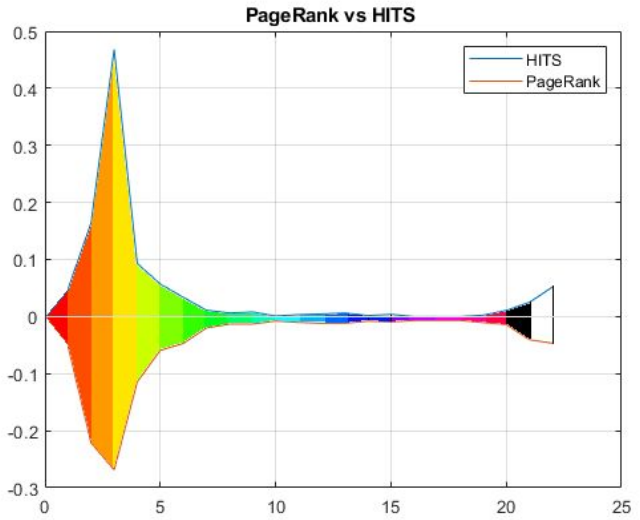
The recipes form an assortative network



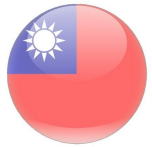
PageRank



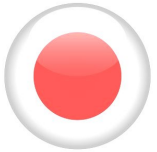




ITALY



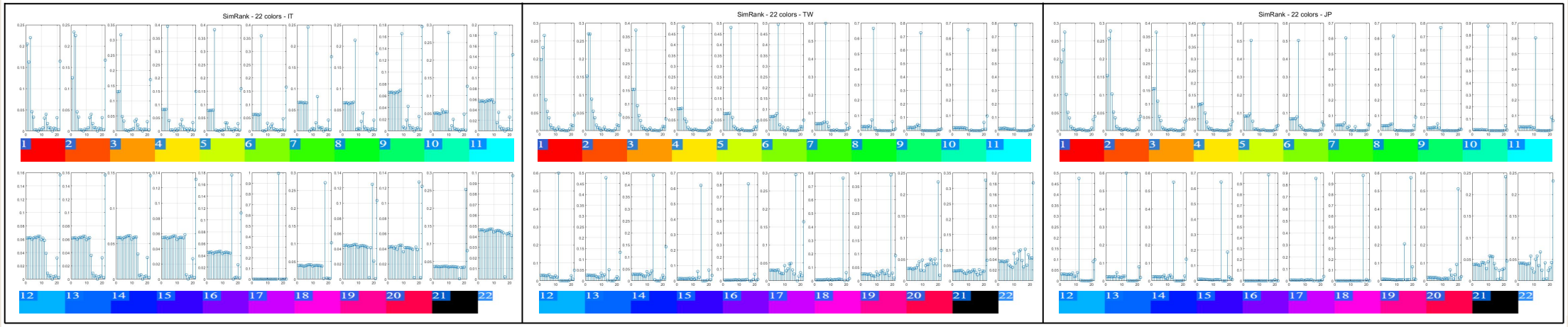
TAIWAN



JAPAN

- **Red, orange** and **yellow** as the **most important colors**
- **Main differences** between **Italian** and **Asiatic** data sets
- **Color processing** and **HSV (saturation and value) issues** on **Italian** set

SimRank

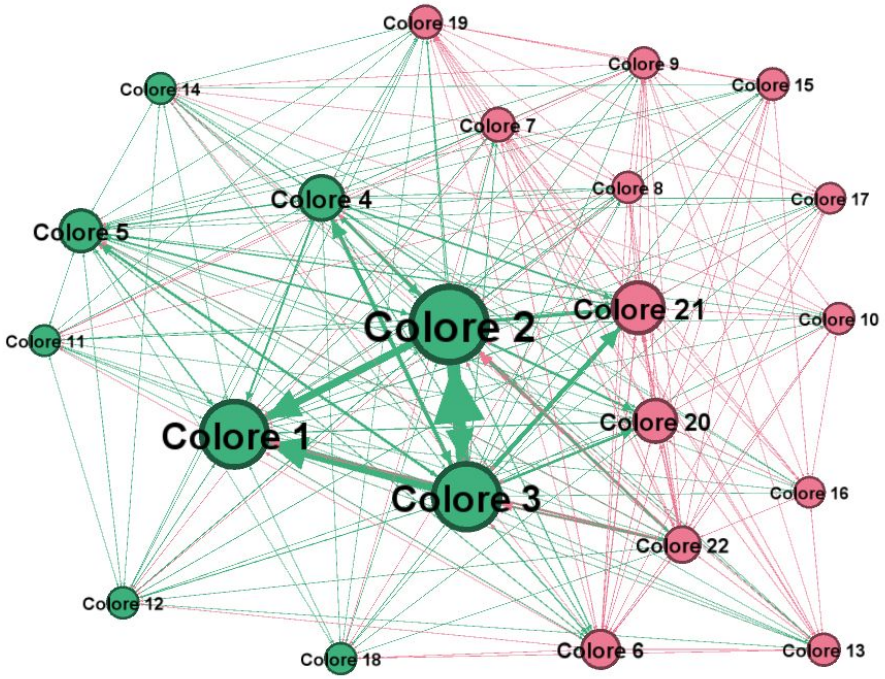


ITALY **TAIWAN** **JAPAN**

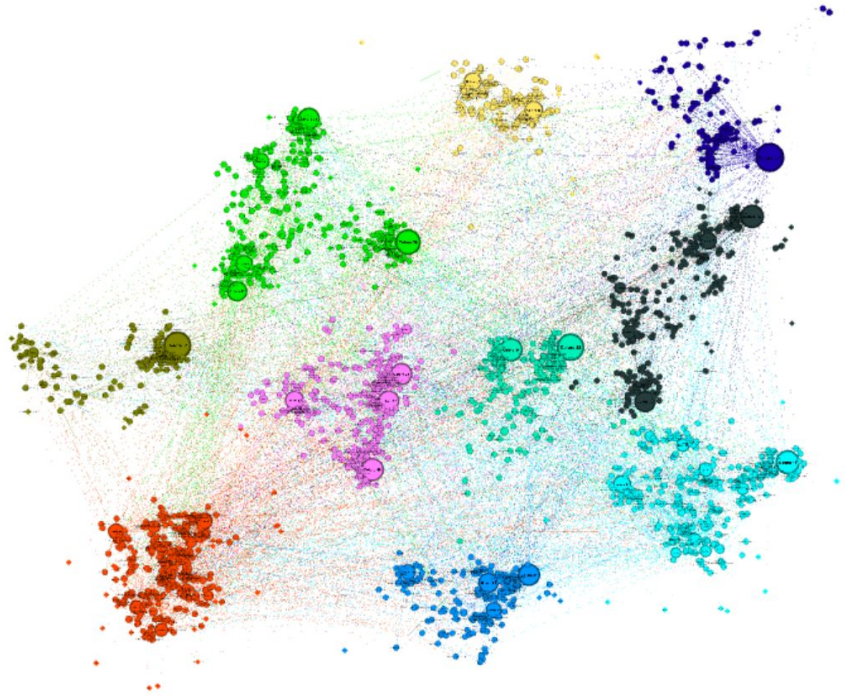
- **Very homogeneous Italian network**
- **Main differences** between **Italian** and **Asiatic** data sets
- **Same color pairings** for **Taiwanese** and **Japanese** recipes

Community detection

Gephi



22 colors

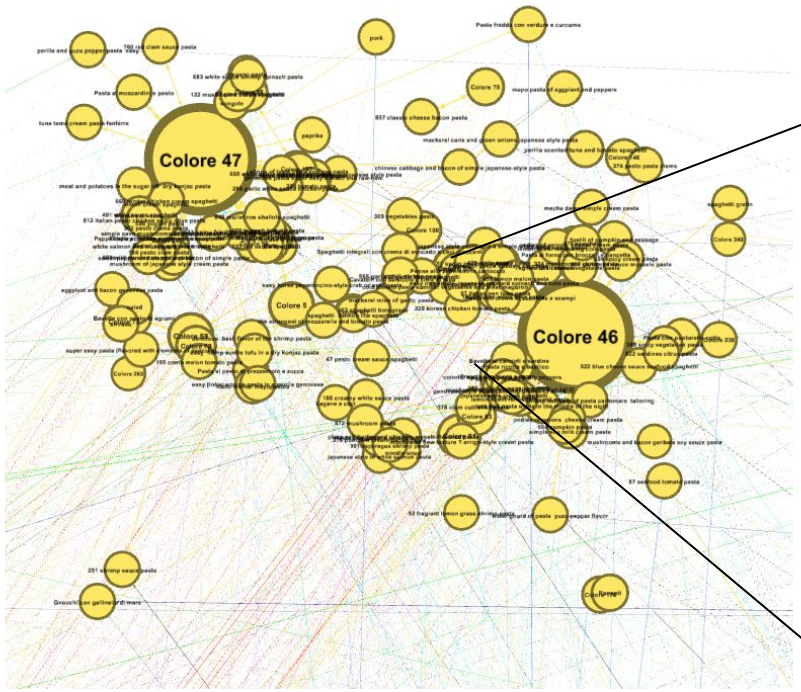


362 colors and recipes

- **2 communities**: **canonical** and **unusual recipes (colors)**
- **Size** based on node **importance**

- **No clustering** based on recipes **provenience**
- **Main colors hubs** and other minors for **each cluster**

Community example



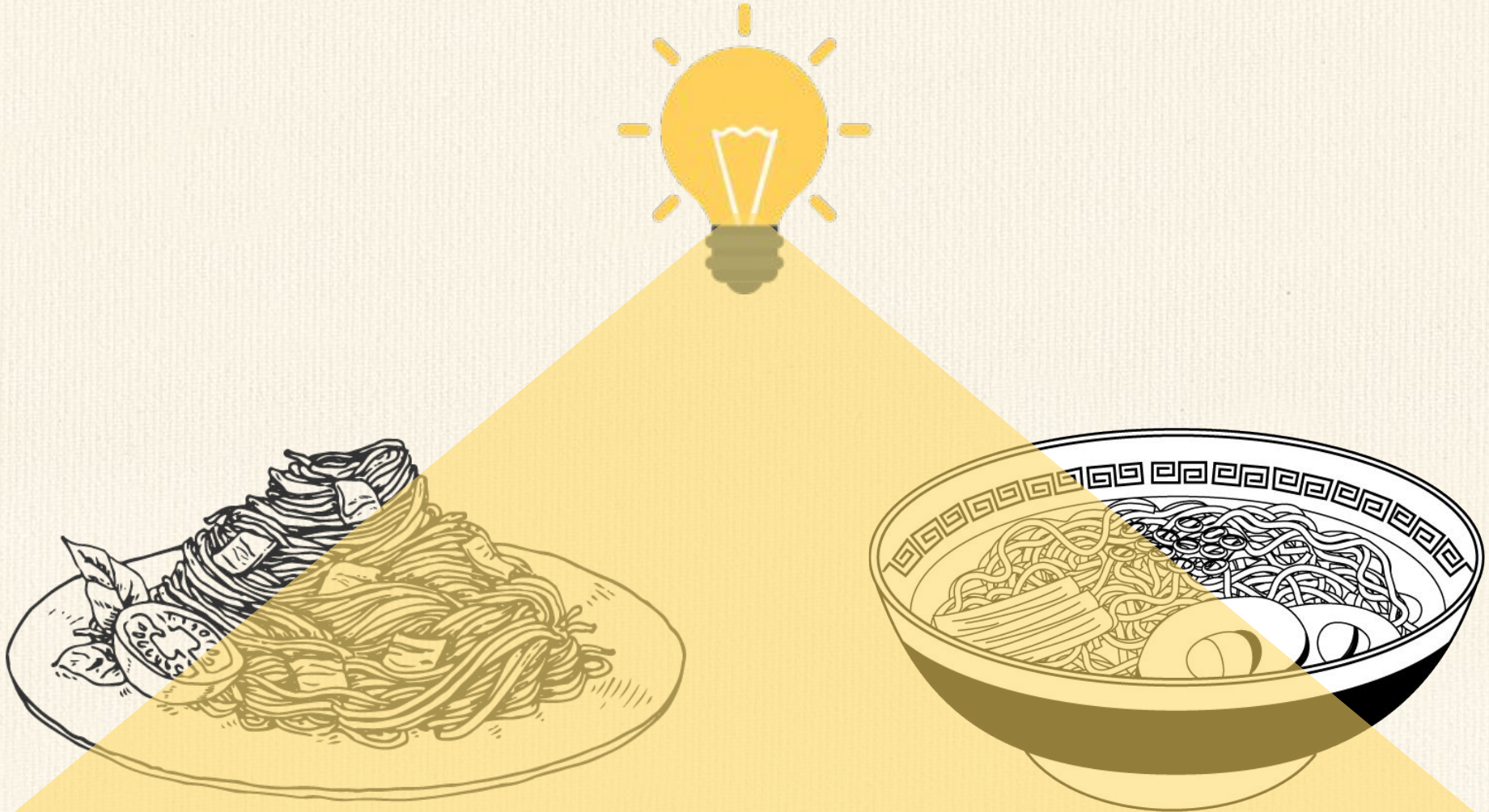
46 - 47

- **Similar colors** but **very different ingredients**
- **Size** based on node **importance**

Color 47 - Color 75 -> Cabbage and bacon pasta

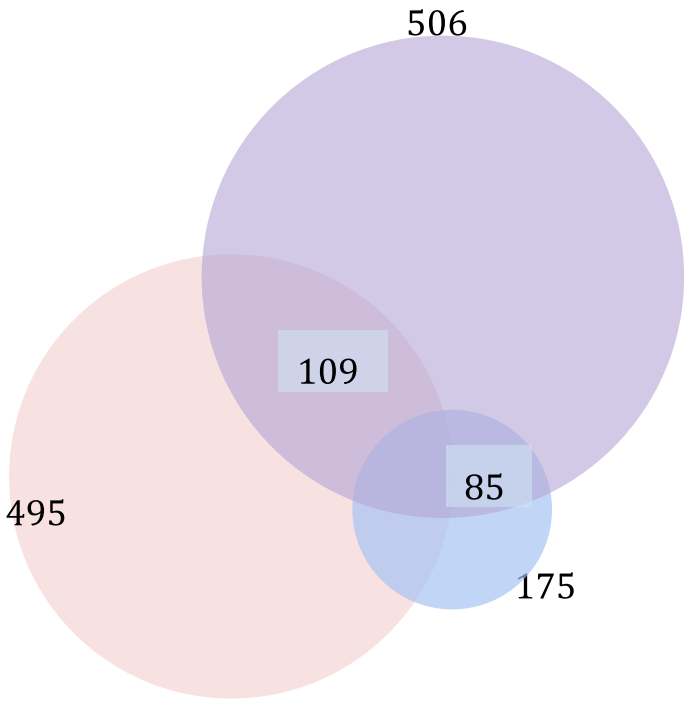
Color 46 - Color 75 -> Eggplants and green pepper pasta

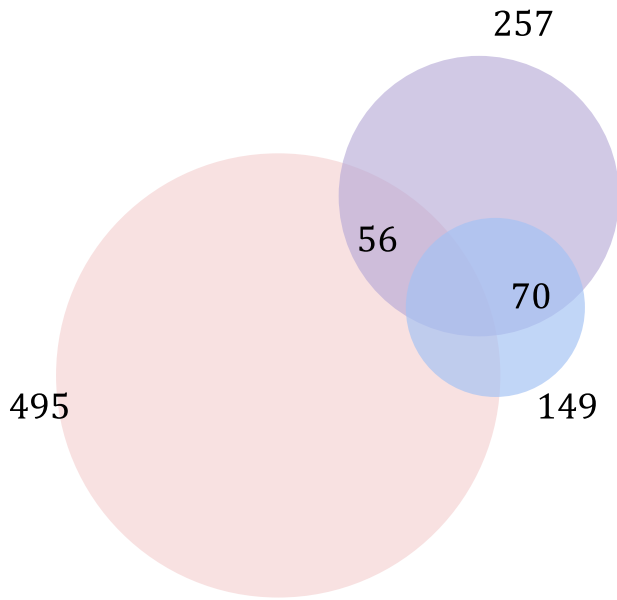
Insights



Ingredient network

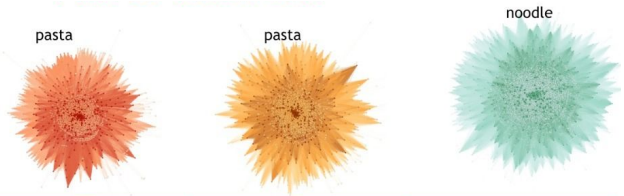
Pasta as new food or localize food?





Flavor network

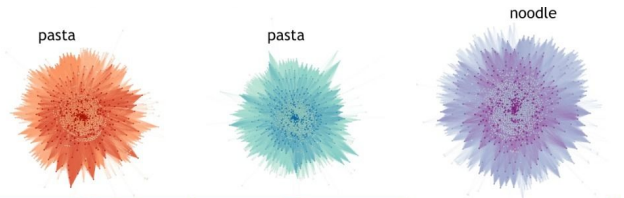
Does the pasta flavor change due to the preference of local staple food?



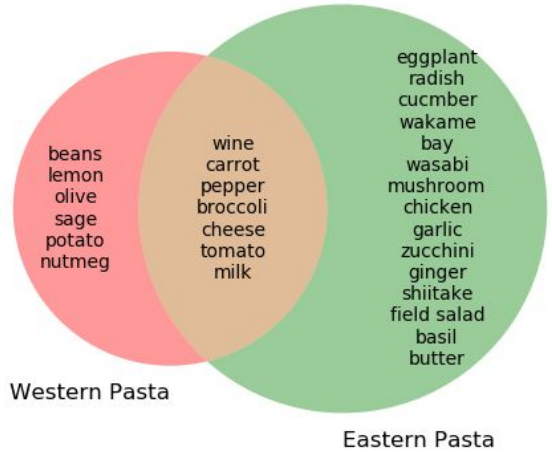
Average Degree	357	409	469
Av. Weighted Degree	2704	3804	2730
Average Link Weight	4.2913	5.5562	5.9958
Network Diameter	4	4	4
Average Path Length	1.903	1.907	1.985
γ	2.5281	2.3516	2.1871

diversity of flavor

strength of the flavor

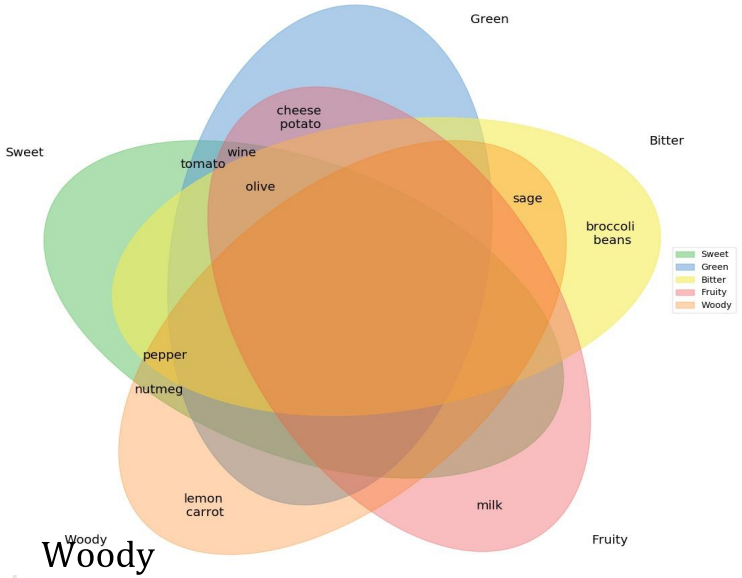


Average Degree	357	416	405
Av. Weighted Degree	2704	4096	2853
Average Link Weight	4.2913	6.0503	7.8522
Network Diameter	4	4	4
Average Path Length	1.903	1.902	1.941
γ	2.5281	2.2676	2.6776

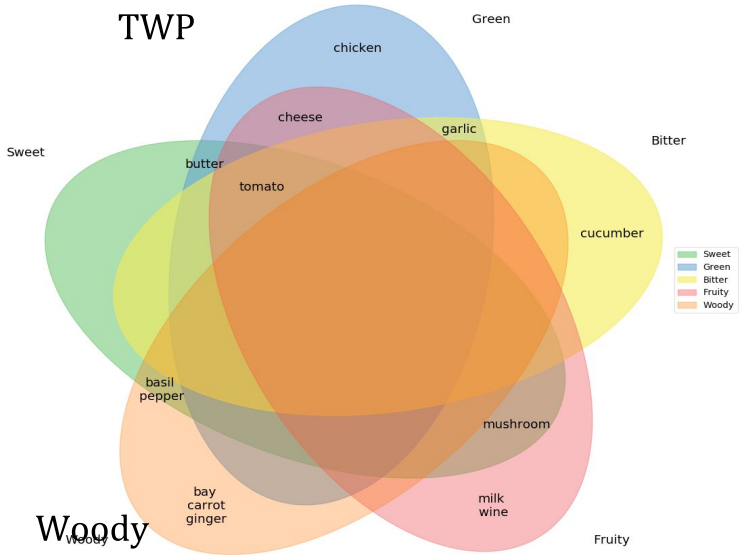


Flavor network

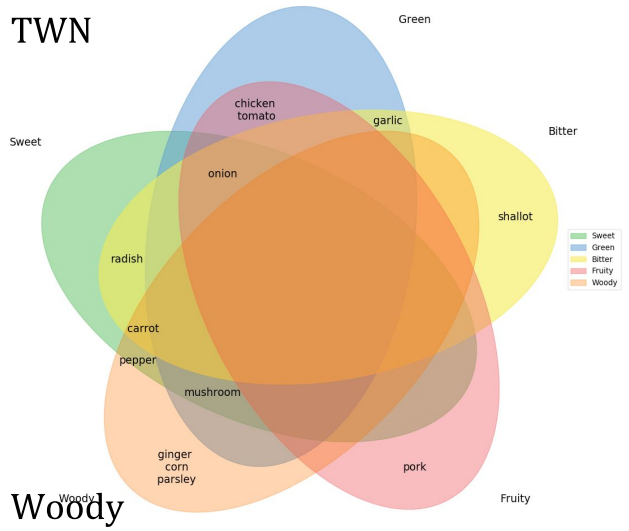
ITP



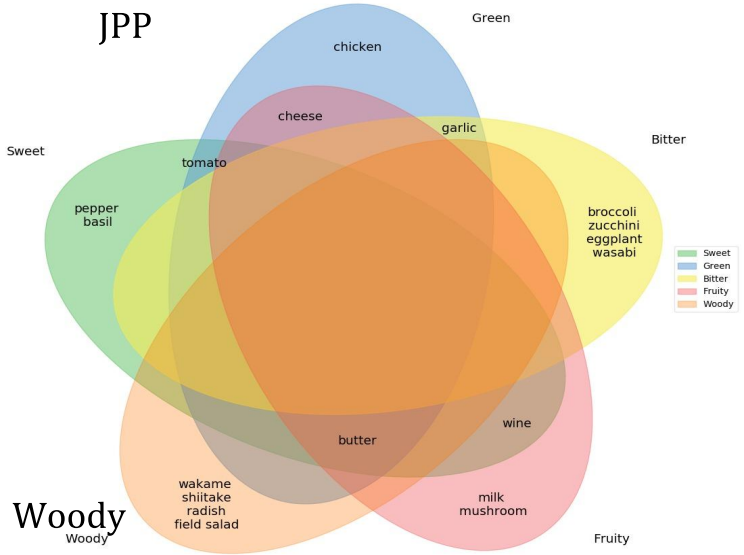
TWP



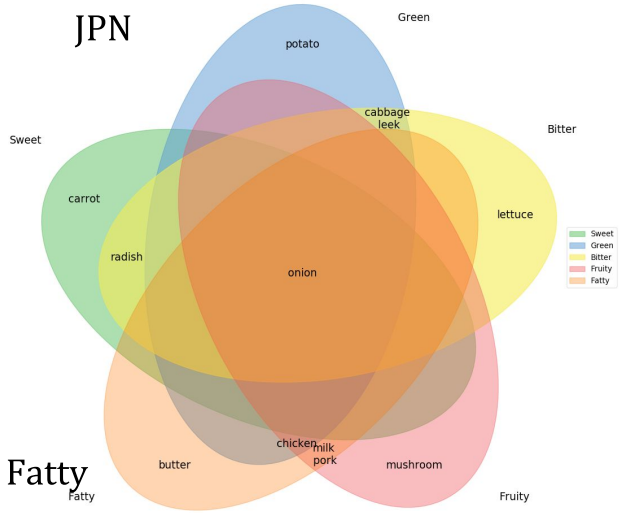
TWN



JPP



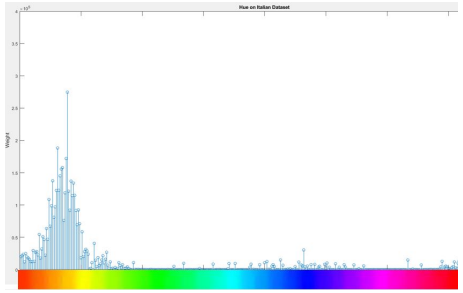
JPN



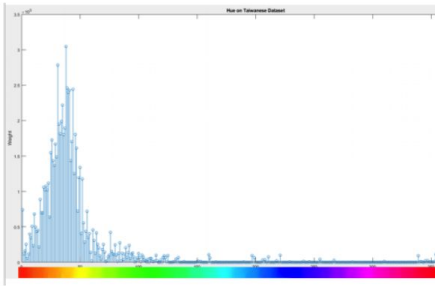
Color network

Is the visual preference of pasta change due to the preference of local staple food?

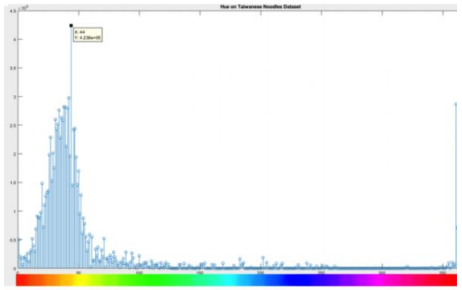
ITP

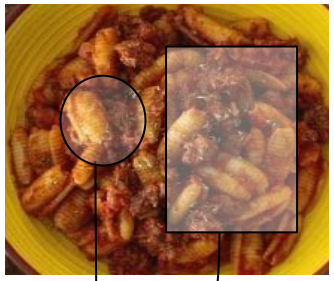


TWP



TWN



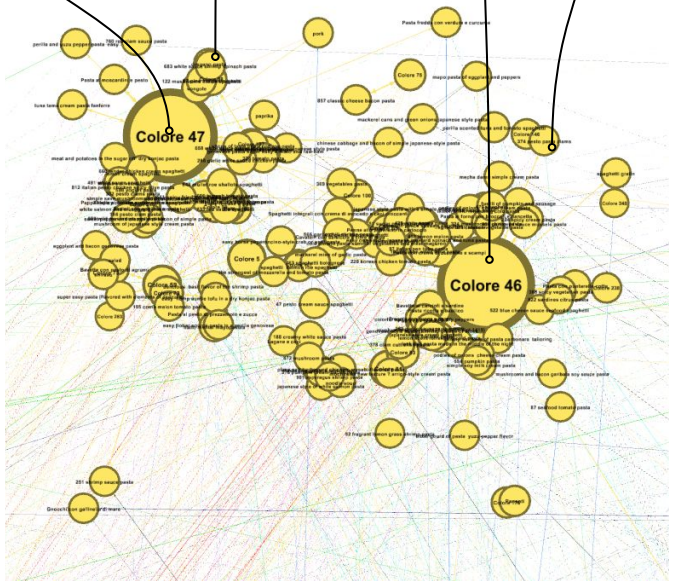


sauce

noodle

topping

pasta



Role of each participant in the project

★ DANA - SOCIAL ANALYSIS

IP 7.1

★ ELENA - SECOND PART OF THE PASTA NETWORK ANALYSIS, MATRICES BUILDING AND EXCEL TABLES

★ LAURA - FIRST PART OF THE PASTA NETWORK ANALYSIS, EXCEL TABLES AND CONCLUSIVE DIAGRAMS

★ MATTEO - DATA COLLECTION AND ANALYSIS OF THE NOODLE NETWORK

IP 7.2

★ ANIELLO - DATA COLLECTION AND NETWORKS ANALYSIS

★ FEDERICO - DATA CLEANING, DATA PRESENTATION, REPORT AND POWERPOINT

IP 7.3

★ DANIELE - COLOR SPACE AND PROCESSING, PAGERANK, SIMRANK, COMMUNITIES

★ GIOVANNI - COLOR SPACE AND PROCESSING, COLOR ANALYSIS, NETWORK PARAMETERS AND ASSORTATIVITY