



GROUP 9

Economical Outdoor Travelling for Photograph Lovers

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Outline



SUMMARY

Motivation & Objectives
Challenges & Achievement



SYSTEM DESIGN & DEMONSTRATION

System Demostration
Framework (Data & Algorithms)



EXPERIMENT: ONE-DAY TRIP

Validation via practice
Publicly available possibility

SUMMARY

Motivation & Objectives: sustainability

Challenges: data, recommendation



Motivation

Background

- People prefer to customize travel plans
- A variety of aspects need to be considered
- It would be more challenging for outdoor photographers

Objective

- To provide photographers with travel plans
- To recommend various famous locations
- To provide economical tour plans for tourists



Highlights

Sustainability

- Place Recommendation:
 - Places few people explore
 - Happiness Level: sight views, crowdedness
 - Local Culture Discovery
- Path Planning:
 - Traffic Cost
 - Travel Time
 - Calorie (environmental-friendly)
Resource saving



Challenges

Data Collections

Where to collect?

- Public photo sharing website

What to collect?

- Location
- popularity

Recommendation

Sustainable?

Handle conflict between
beauty for photograph
&
few population

Path Planning

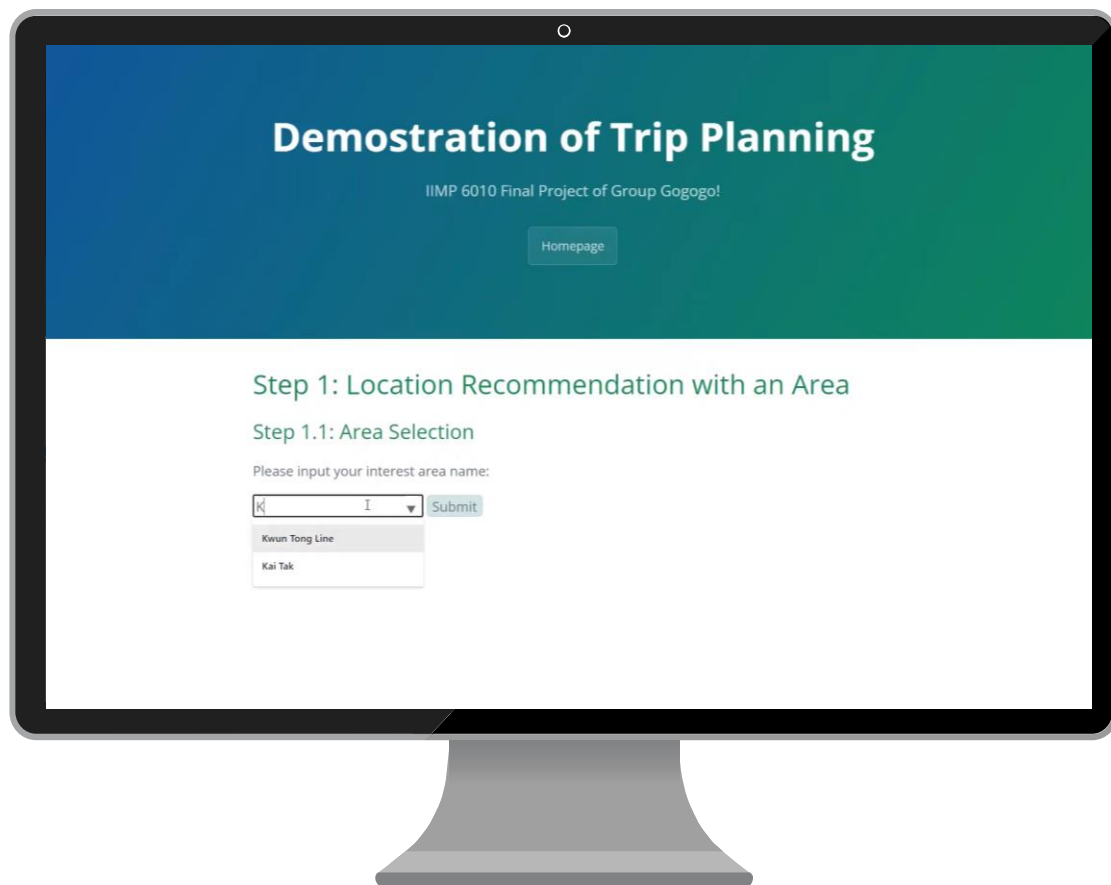
How to set the happy
cost for each path
from one place to the
others.

How to solve the TSP
problem.

SYSTEM DESIGN & DEMONSTRATION

Demostration
&
Framework





System Demostration

The demo shows the interactive user interface to get recommended locations and path planning.

Framework

Step1 Public photo data collection

Data crawling from public
photo website



Step 2 Recommendation algorithm

Sustainability and happiness
constraints for filtering



Step 3 Path planning

Happiness related weights
Greedy algorithm



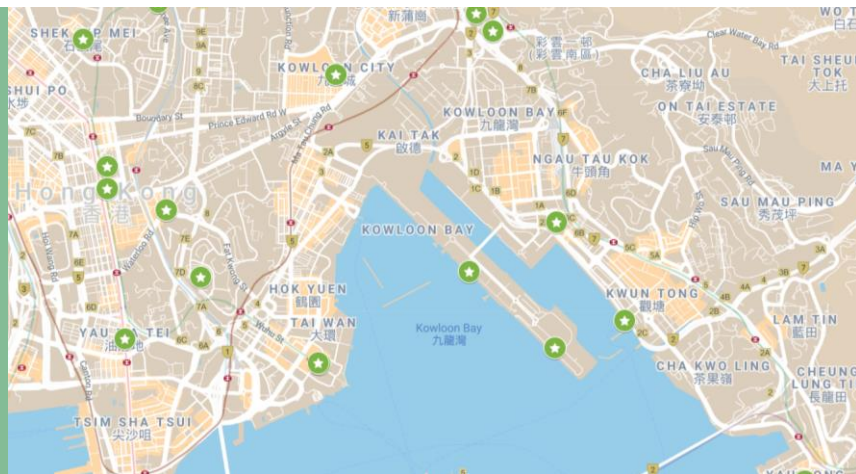
Step 3 Visualization

Interactive map with
recommended location and
computed paths



Step 1: Data Collection

Search for
Neighborhood Areas



Brief introduction of the algorithm

List of candidate locations

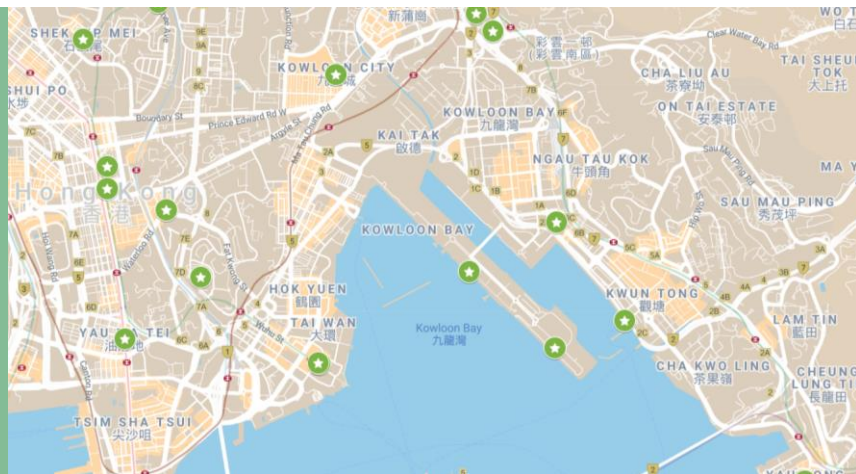


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2	ngautaukok	6150	308	https://www.instagram.com/p/CHDGyYhDBi
3	jimmybridge	266	139	https://www.instagram.com/p/B-Lu8PegvMu
4	志明橋	2878	1818	https://www.instagram.com/p/B-g4SmID55C
5	kowloonbay	43807	955	https://www.instagram.com/p/CLwBqleD1_n
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9	diamondhillhongkong	334	478	https://www.instagram.com/p/CD_MehyF5Aa
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11	九龍塘	40390	416	https://www.instagram.com/p/CPFILdINE_N
12	kowloontong	19911	436	https://www.instagram.com/p/CL3PijhjpO_
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14	princeedwardstation	960	634	https://www.instagram.com/p/CTTfcVUI4I-
15	mongkok	569394	742	https://www.instagram.com/p/CV-gg5ov_H_
16	yaumatei	50690	435	https://www.instagram.com/p/CQ022GRBPwr
17	homantin	8214	1024	https://www.instagram.com/p/B_H-gVkDPQL
18	oimanestate	1110	425	https://www.instagram.com/p/CO8pnj9gNZ3
19	愛民邨	1993	255	https://www.instagram.com/p/B1Z11m2gwYH
20	whampoa	26166	727	https://www.instagram.com/p/CQARxWqr9k0
21	kaitai	1976	839	https://www.instagram.com/p/B_rp9GRj3JJ
22	啟德郵輪碼頭	5333	276	https://www.instagram.com/p/COAbs9JjMGn

Step 2 Recommendation – before filtering

Get Hot Places for
Photography



Brief introduction of the algorithm

```

1 #Pseudocode for recommendation searching
2
3 RecomSe(List j,num n)
4     # j -- list of candidate locations
5     # n -- number of locations that user want to visit
6     List k;      # list to store left locations after 1st iteration
7     For i = 0 To j.lenth
8         If j[i].tagNum < 30k And j[i].tagNum > 1k
9             k[i].tagNum=j.tagNum
10            k[i].likes=j.likes
11        Endif
12        i=i+1
13    Endfor
14
15    If i < n
16        return k
17    Endif
18
19    #sort top N locations by the number of likes from previous filter
20    return sort(k.likes,num n)
21 end RecomSe

```


Step 2 Recommendation – after filtering

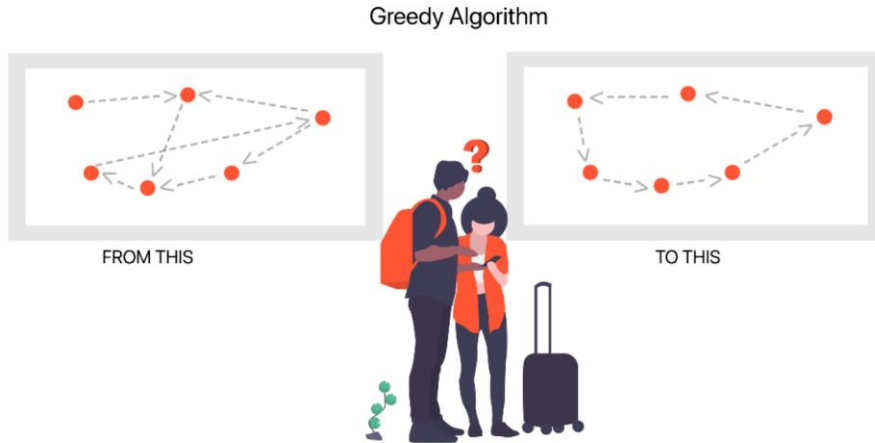
Economical Filtering



Brief introduction of the algorithm

Step 3 Path Planning

Travelling Salesman Problem



The traveling salesman problem consists of a set of cities. The salesman has to visit each one of the cities starting from a certain one (e.g. the hometown) and returning to the same city. The challenge of the problem is that the traveling salesman wants to minimize the total cost of the trip

Step 2: Path Planning with Preferences

Step 2.1: Select Source Location

Choose a place to set off:

We will set off from ***HKUST***.

Step 2.2: Select Your Weights for Path Planning

Please use the slider to adjust the weights in terms of ***Calories***, ***Cost***, ***Time*** to define your travel ***Happiness***:

Calories:



Cost:



Time:



Locations: Traffic Time (min)

	HKUST	Jimmy Bridge	Kai Tak public Piers	Choi Hung Estate Car Park	方荣记	Qi Man Estate Kai Man house	Whampoa world
HKUST	0	68	110	54	72	98	104
Jimmy Bridge	68	0	33	27	50	66	44
Kai Tak public Piers	110	33	0	53	78	75	61
Choi Hung Estate Car Park	54	27	53	0	29	39	29
方荣记	72	50	78	29	0	46	33
Qi Man Estate Kai Man house	98	66	75	39	46	0	24
Whampoa world	104	44	61	29	33	24	0

Locations: Traffic Cost (HKD)

	HKUST	Jimmy Bridge	Kai Tak public Piers	Choi Hung Estate Car Park	方榮記	Qi Man Estate Kai Man house	Whampoa world
HKUST	0	11	15.3	6.9	7.5	18.5	10.5
Jimmy Bridge	11	0	0	7.2	5.4	6.2	10.5
Kai Tak public Piers	15.3	0	0	5.3	5.3	9.7	9.7
Choi Hung Estate Car Park	6.9	7.2	5.3	0	5.4	8.3	8.3
方榮記	7.5	5.4	5.3	5.4	0	11.3	5.4
Qi Man Estate Kai Man house	18.5	6.2	9.7	8.3	11.3	0	4.5
Whampoa world	10.5	10.5	9.7	8.3	5.4	4.5	0

Locations: Calorie

	HKUST	Jimmy Bridge	Kai Tak public Piers	Choi Hung Estate Car Park	方荣记	Qi Man Estate Kai Man house	Whampoa world
HKUST	0	68	125.1	8.34	45.87	96.0	66.72
Jimmy Bridge	121	0	138	29.2	72.8	100	61.5
Kai Tak public Piers	125.1	138	0	95.5	83	154.3	95.91
Choi Hung Estate Car Park	8.34	29.2	95.5	0	58.4	104.25	33.36
方荣记	45.87	72.8	83	58.4	0	62.55	33.4
Qi Man Estate Kai Man house	96.0	100	154.3	104.25	62.55	0	91.74
Whampoa world	66.72	61.5	95.91	33.36	33.4	91.74	0

Travelling Salesman Problem——greedy algorithm

Introduction

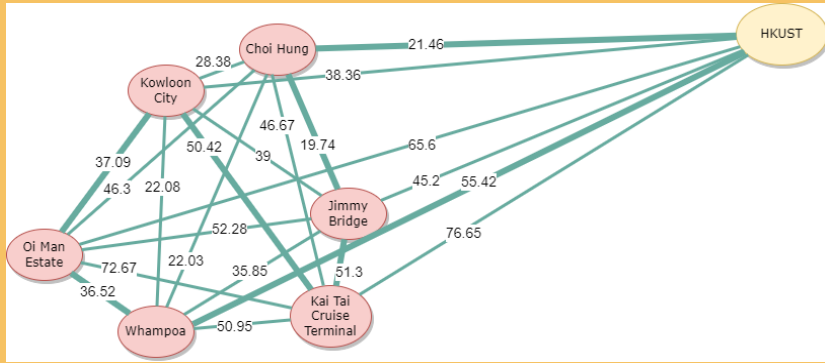
As the name suggests a greedy algorithm, always makes the choice that is **best at that moment**. This means that it makes a locally optimal choice in the hope that this choice will lead to a globally optimal solution.

Implementation

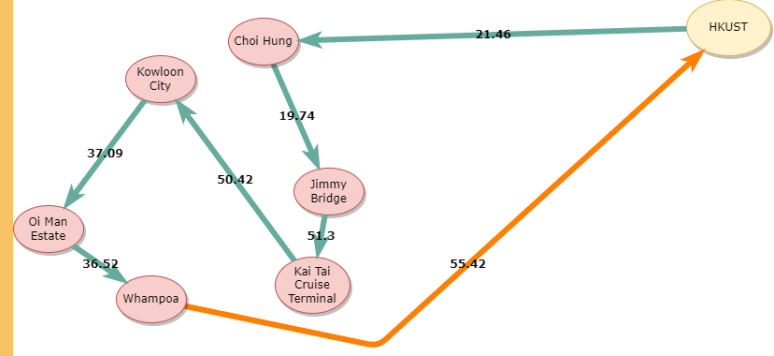
It begins by sorting all the edges and then selects the edge with the minimum cost. It continuously selects the best next choices given a condition that no loops are formed.

Demo of Greedy based TSP

path graph



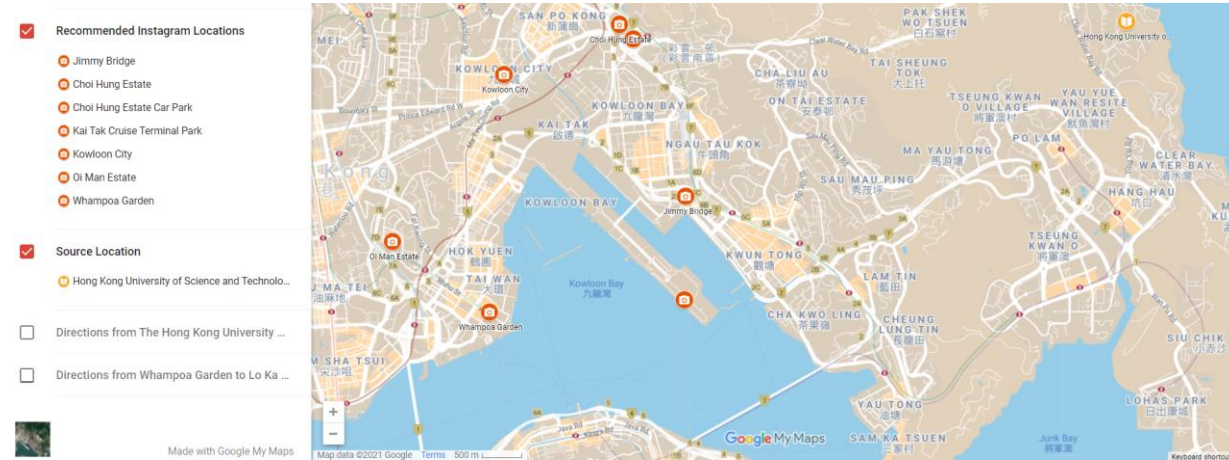
computed path



The algorithm gives the path as :

**HKUST → Choi Hung → Jimmy Bridge → Kai Tai Cruise
Terminal → Kowloon City → Oi Man Estate → Whampoa**

Step 4 Visualization



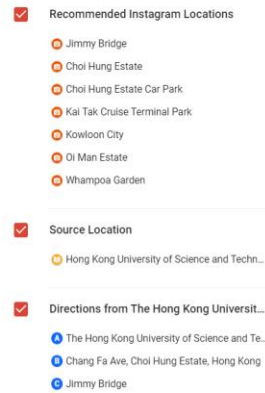
Visualize all in Google MyMaps

Finally, we visualize our recommended places and paths in Google MyMaps.

Google MyMaps

Individual map customization

We give an initial suggested map and path planning for users, and then later the user can feel free to change locations and path in his own map.



EXPERIMENT

Gogogo! Go for a trip!



Let's start

Jimmy Bridge

In 2010, the protagonists Zhang Zhiming and Yu Chunjiao in the film "Zhi Ming and Chun Jiao" were alone on the sky bridge for the first time, making the bridge a craze, and the name "Zhi Ming Bridge" also came into being.



Kai Tak Cruise Terminal

The Kai Tak Cruise Terminal Park is located at the flat roof of the Kai Tak Cruise Terminal Building at 33 Shing Fung Road, Kowloon. The Park occupies an area of 23,000 square meters with passive amenities including a central lawn, a viewing platform, water garden, fountain plaza, etc.



Fong Wing Kee Hot Pot Restaurant (Kowloon City)

Satay beef may be a favorite of many people, so this Fong Wing Kee especially uses this as a signboard to provide foodies with their professional gestures.

評分

味道



環境



服務



衛生

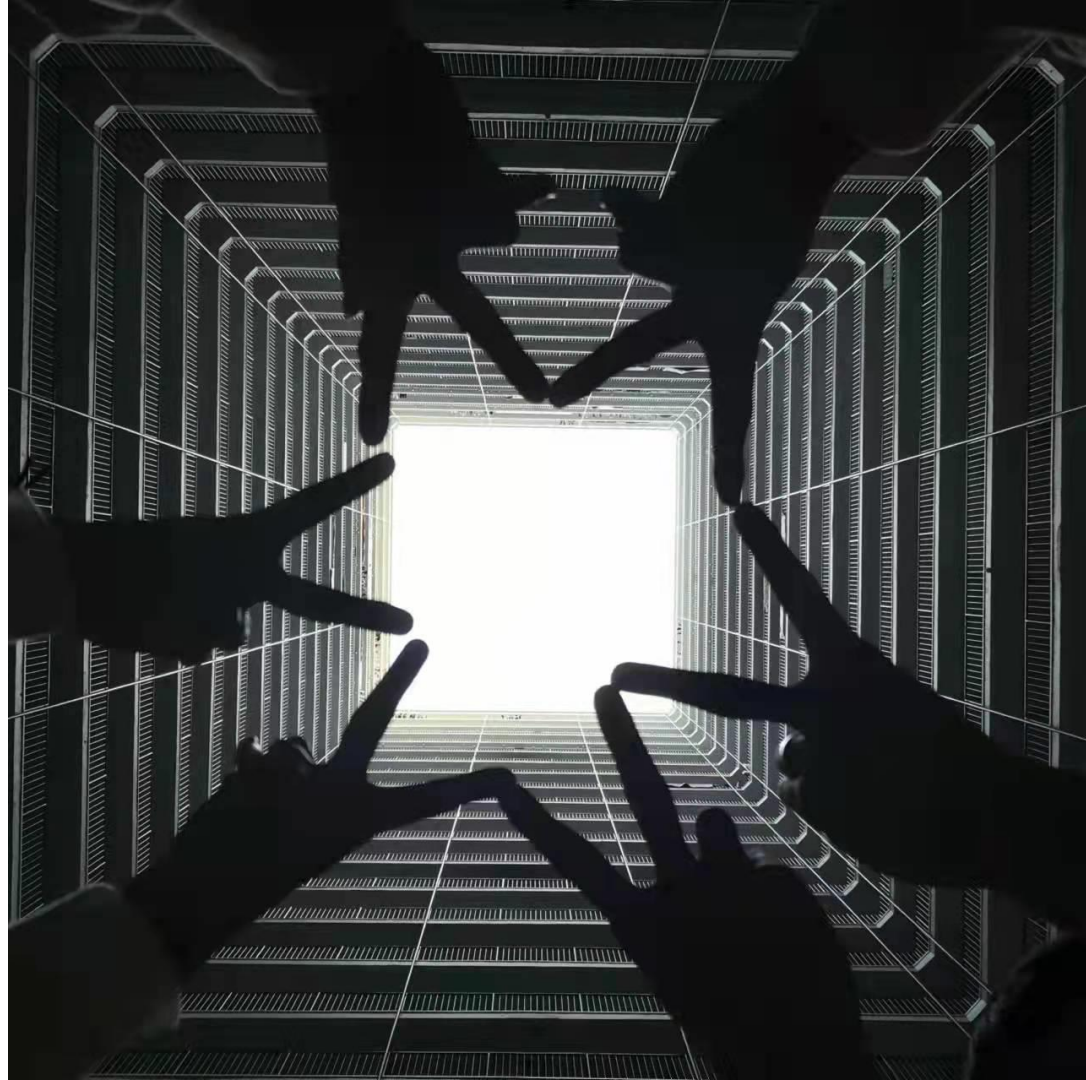


抵食



Oi Man Estate

- The soul of Hong Kong architecture, repetition and intensive
- The 40-year-old Oi Man Estate is the largest traditional Hong Kong-style HDB flat in Kowloon City District
- Each building has its own personality and has also witnessed the development of Hong Kong.



Whampoa World



Hong Kong is home to many structural curiosities, and among the quirkiest has got to be **the Whampoa** — a shopping mall shaped like a luxury cruise ship. Located in Hung Hom, Kowloon, the concrete boat is part of a larger shopping arcade named the **The Wonderful Worlds of Whampoa**, which is a complex of shops, restaurants, and residential buildings.



Whampoa is right next to a seaside promenade with great views of Victoria Harbour, and is accessible by ferry to the Hung Hom Ferry Pier as well as by bus and MTR.

Thanks!

Does anyone have any questions?

Homepage: <https://chenyingshu.github.io/gogogo/>

