



Trip Planning with the Crowd

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Motivation

- Existing online trip planning platforms (in China)
 - Itinerary planning sites (e.g. QiongYou)
 - Travel information sharing sites (e.g. MaFengWo, Baidu Travelling)
 - Travel products markets (e.g. Ctrip)
- **Problems**
 - **Passive information receiving**
 - **Tedious filtering**
 - **Scattered sources**



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- Problems
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 - Tedious filtering
 - Scattered sources

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 - **Real-time discussion**
 - **Help from the crowd**
 - **Integrated in one platform**



Project Introduction

- Objective: Building a **crowdsourced** collaborative trip planning (CCIP) system
 - Find planning helpers from the crowd (natives or past travellers of your destination)



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 - Find planning helpers from the crowd (natives or past travellers of your destination)
 - **Support real-time collaboration online**



Related Work

- Planning with travelling companions:
 - Products: Qiongyou, Travefy, Roadtrippers
 - Studies: Voyage, CLIP
- Planning with helpers:
 - Products: Shijiebang, Qiongyou, Umapped
 - Studies: Mobi, Crowdcierge

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Problems:

- 1) Lack of real-time collaborative editing features
(automatic updating / conflict resolution)
- 2) Lack of planning helpers

Problems:

- 1) Agency systems:
Limited participation of users
- 2) Crowdsourced systems:
Designed for crowd workers instead of users



Project Introduction (cont.)

- Objective: Building a crowdsourced collaborative trip planning (CCIP) system
 - Find planning helpers from the crowd (natives or past travellers of your destination)
 - Support real-time collaboration online
- Method: User-centered system design
 - **User research:** Get to real users via interviews and questionnaires to know about their current trip planning processes as well as needs
 - **System design:** Design features, conceptual models, usage scenarios and interfaces based on user research results
 - **Prototyping:** Create prototype and get user feedback via testing
 - **User testing:** Evaluate the usability and user experience of the prototype via observations and interviews



User Research

- Research Objective
 - To know about **how users usually plan their trips**
 - To know about **whether user would need/favor CCIP**



User Research

- Research Objective
 - To know about how users usually plan their trips
 - To know about whether user would need/favor CCIP
- Research Questions
 - What are the **most common scenarios and workflows of trip planning** nowadays? What are people's ideal workflows?
 - **What values provided by whom** might **improve** people's **trip planning experience**?
 - How is **collaborative trip planning** favored compared with planning alone/with agency?
 - How are people **willing to participate** in CCIP?



User Research

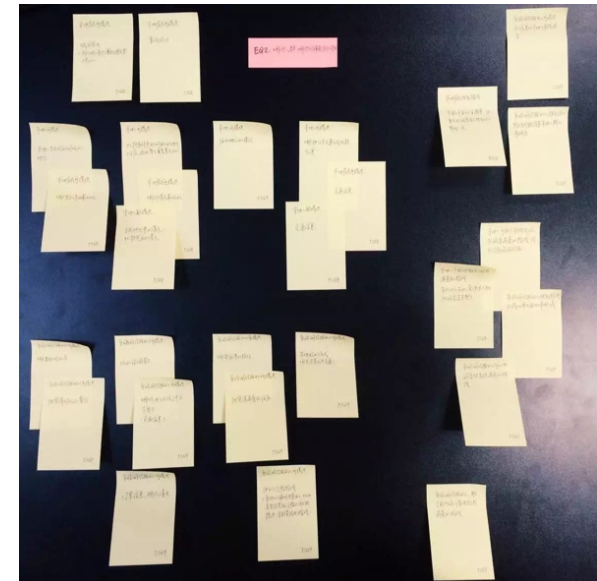
- **Research Protocol**

- Object of study: All individuals likely to use CCIP (focused on younger people)
- Sampling method: Convenience sampling
- Sample size: **3** (interviews) + **162** (questionnaires)
- Research method:
 - **Semi-structured interview** (for qualitative data)
 - **Web-based questionnaire** (for quantitative data)



User Research

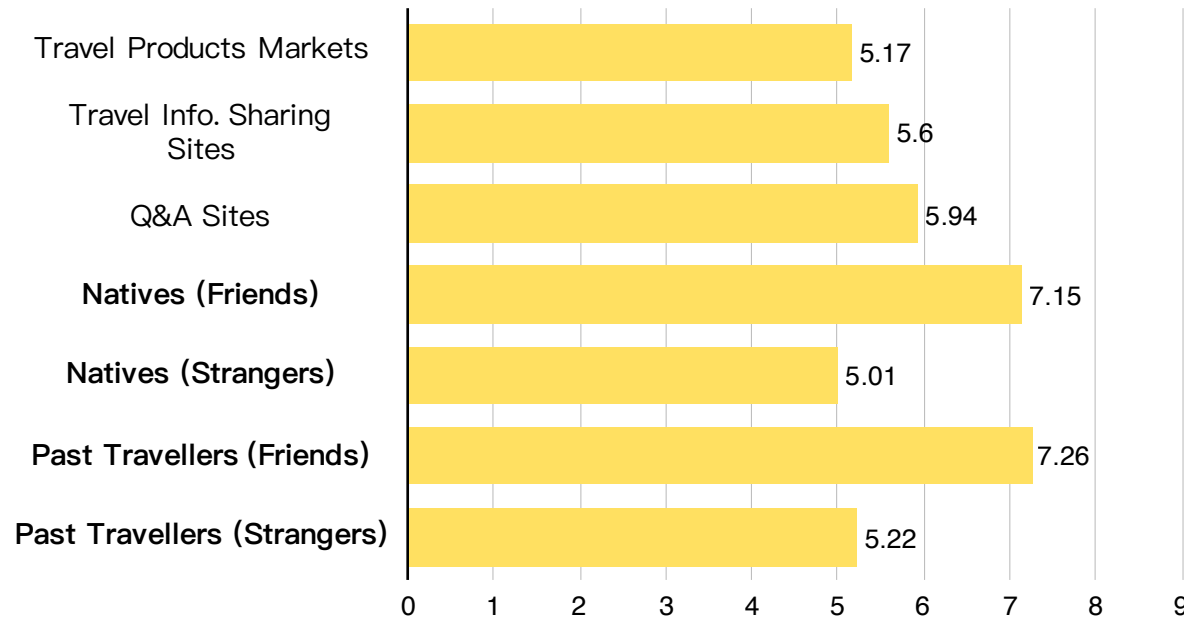
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 - Sample size: 3 (interviews) + 162 (questionnaires)
 - Research method:
 - Semi-structure interview (for qualitative data)
 - Web-based questionnaire (for quantitative data)
- Analysis Protocol
 - Qualitative: **Affinity diagram**
 - Quantitative: Statistical analysis



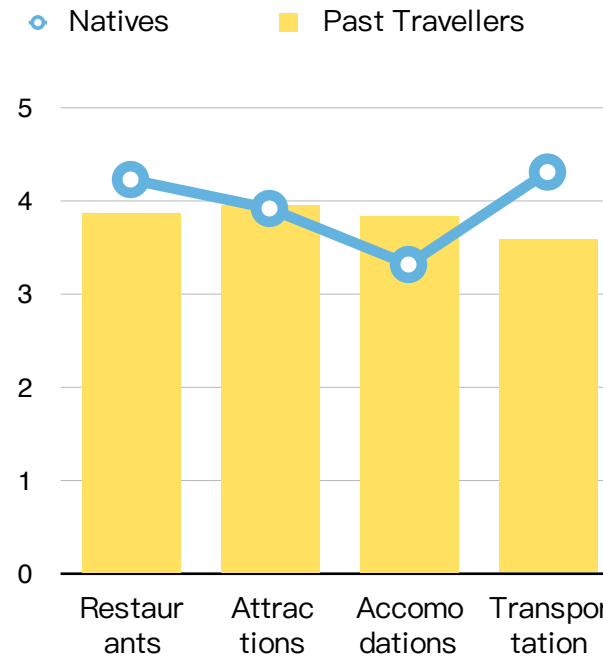
Affinity Diagram of Interview Data



User Research: Important Results



Value Ratings of Information Sources



Value Ratings of Categorical Information Provided by Planning Helpers



User Research: Summary & Design Implications

- **Crowd planning helpers provide extra value for trip planners**
- Real-time collaborative editing offers a good way of information sharing and communication among multiple users
- **Natives and past travellers provide information of complementary value**
- People trust friends far more than strangers
- People are concerned about problems of trust, authority, satisfaction, communication and motivation

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- Crowd planning helpers will improve trip planning experience
- Real-time collaborative editing features will improve collaboration experience
- Both natives and past travellers should be involved
- Friends instead of strangers should be encouraged to participate
- Should add social networking, access management, user profile, user recommendation, real-time communication and reward system features.



Feature Design

- Real-Time Collaborative Editing
- Real-Time Discussion
- Social Networking (Add Friends)
- User Profile
- User Recommendation
- Access Management
- Reward System



Conceptual Model Design

- **Metaphor:** Map + Notes + Whiteboard
- **Concepts:** Itinerary, user, discussion board, map, route, POI list, POI, etc.
- **Relationships:** Each itinerary corresponds to 3 POI lists (Attractions/Restaurants/Accommodations); etc.
- **Mappings:** The POI list corresponds to the set of POIs marked interested by users (travellers) or recommended by users (planning helpers); etc.



Usage Scenario Design

Usage Scenario: Multiple users planning together for a trip to Suzhou

Participants:

Andrea (Traveller–Creator), **Bella** (Traveller–Companion), **Calvin** (Helper–Native), **Diane** (Helper–Past traveller)

Scenario:

Andrea adds requirements: “Wish to take photos at attractions”, “Wish to know about local art”;

Andrea browses through the Attraction POI List and shows interest (of level 3) in the “Lion Forest Garden”;

Bella adds requirement: “Please recommend some restaurants!”

Bella browses through the Attraction POI List and shows interest (of level 5) in “Suzhou Musuem”;

Diane sees the requirement “Wish to take photos at attractions”, searches the Attraction POI List for “Suzhou University”, and recommends it with level 5 and a comment “Many historic buildings for photography”;

Diane filters the Attraction POI List for only those marked interest by the travellers;

Diane sees the “Lion Forest Garden” and makes a comment “Looks like the Yu Garden”;

Calvin observes that Andrea and Bella are both online, and asks “What are your taste preferences?”;

Andrea replies “A bit light”;

Bella replies “I enjoy all kinds of food!”;

Calvin searches the Restaurants POI List for “Xian Hua Xian Shi” and recommends it with level 5 and a comment “The small wontons and the mung bean soup are fabulous!”

...



Interface Design

创建行程

选择目的地：

选择出行时间： 至

选择同行者：



+

选择协同规划的目的地居民：











选择协同规划的目的地历史游客：











确定

May 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3

Interface: Create a trip

Interface Design

创建行程

Choose destination

选择目的地:

Choose time of travel

选择出行时间: 至

Choose companions

选择同行者:



+

Choose planning helpers
(natives)

选择协同规划的目的地居民:











Choose planning helpers
(past travellers)

选择协同规划的目的地历史游客:











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确定

Interface: Create a trip

Interface Design

创建行程

选择目的地:

选择出行时间: 至

选择同行者:



+

选择协同规划的目的地居民:











选择协同规划的目的地历史游客:











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确定

Recommending
planning helpers
(Favoring planners'
friends)

Interface: Create a trip

Interface Design

创建行程

选择目的地：

选择出行时间： 至

选择同行者：



+

选择协同规划的目的地居民：





用户名：许扬
好友关系：1级
年龄：25
居住地：上海
兴趣爱好：摄影、音乐

选择协同规划的目的











确定

Recommending
planning helpers
(Favoring planners'
friends)

Showing user profile
(friendship, age, residence,
hobbies etc.)
on hover

Interface: Create a trip



苏州二日游



行程

D1

+

D2

山塘街

30分钟

间话间食

1小时

苏州香雪海饭店

显示行程: ☐ D1 ☐ D2
显示兴趣: ☒ 玩 ☐ 吃 ☐ 住



兴趣

玩

吃

住

狮子林

★★★★☆ 4.1

+

狮子林是苏州四大名园之一，始建于元代，为元代园林的代表。园内假山遍布，长廊环绕，楼台隐现，曲径通幽，有迷阵一般的感觉。狮子林拥有国内尚存最大的古代假山群，有假山王国之美誉。

山塘街

★★★★☆ 4.6

山塘街曾是明清时期中国商贸、文化最为发达的街区之一，被誉为“神州第一古街”。山塘老街全长360米，店肆林立、会馆齐聚。既有苏州老字号采芝斋、五芳斋、乾生元等小吃店；也有吴韵茶庄、苏州桃花坞木刻年画、紫檀木雕、石雕、刺绣等特色商铺。

拙政园

★★★★☆ 4.3

拙政园，江南园林的代表，苏州园林中面积最大的古典山水园林，是苏州四大古名园之一，也是苏州园林中最大、最著名的一座，被列入《世界文化遗产名录》，堪称中国私家园林经典。

需求

目的地: 苏州

时间: 2017.09.15 - 2017.09.16

希望推荐一些特色小吃店

希望推荐一些适合拍照的景点

希望体验当地传统文化

讨论

不知各位口味偏好如何?

偏清淡吧

稍微能吃点辣~

Interface: Plan a trip

Itinerary Panel

行程

D1

D2

山塘街

30分钟

间话间食

1小时

苏州香雪海饭店

Map Panel
(with POI filters)

苏州二日游

显示行程: ☐D1 ☐D2

显示兴趣: ☒玩 ☐吃 ☐住



Mapbox

POI Panel
(Attractions/Restaurants/
Accommodations)

兴趣

玩吃住

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Participants:

Orange-Creator

Red-Companion

Green-Native

Blue-Past traveller

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Requirements Panel

讨论

不知各位口味偏好如何?

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Discussion Panel

Interface: Plan a trip



Interface: Plan a trip

行程

D1

D2

山塘街

30分钟

间话间食

1小时

苏州香雪海饭店

显示行程: ☐D1 ☐D2

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苏州二日游

Feature:
Collaborative Editing

Interface: Plan a trip

Feature:
Real-time Discussion

Feature:
Access management



苏州二日游

Interface: Plan a trip

Feature:
Collaborative Editing



Feature:
Real-time Discussion

Prototyping

- Skills:
 - HTML/CSS/JavaScript
 - Ionicons
 - Sass
 - Leaflet
 - Mapbox



User Testing

- **Testing Protocol**

- Object of study: All individuals likely to use CCIP (focused on younger people)
- Sampling method: Convenience sampling
- Sample size: **3**
- Testing method: **Direct observation + Semi-structured interview**

- Analysis Protocol

- Affinity diagram



User Testing: Results

- High ratings overall
- Could work on visibility and interaction details



Future Work

- Front-end improvement
- Back-end development
- Collaborative feature testing for multiple users





Thanks!