



LUDWIG-  
MAXIMILIANS-  
UNIVERSITÄT  
MÜNCHEN

LFE Medieninformatik – Susanne Keck

# Travel Route Recommendation

Diploma Thesis

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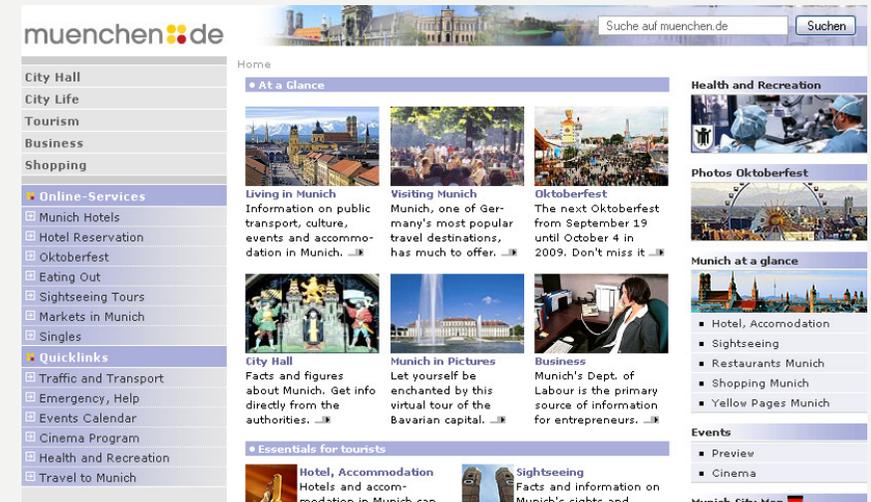
**Date: 02.06.2009**



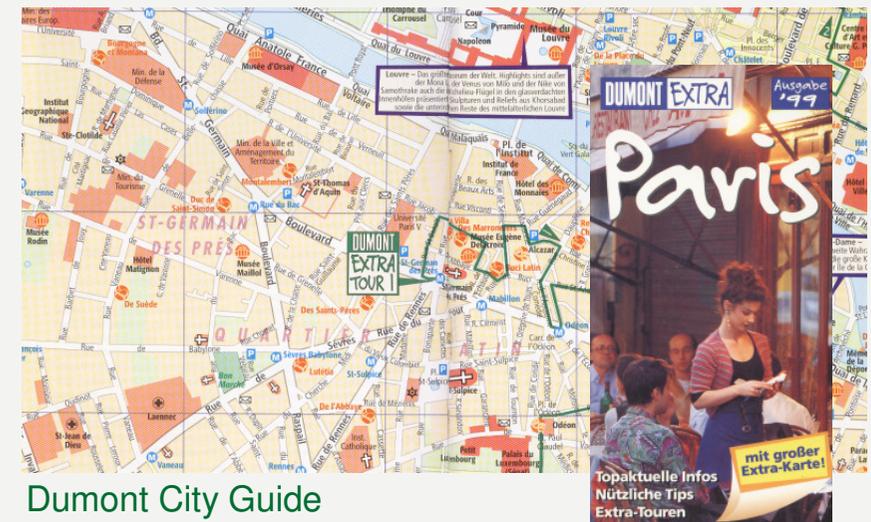


## Motivation

- Limited knowledge of the city, but many different information sources
- Much effort for travellers to select and organize the preferred activities
- No overview provided to view different sights and their locations, no personal recommendations
- Route suggestions do not consider opening times



www.muenchen.de



Dumont City Guide

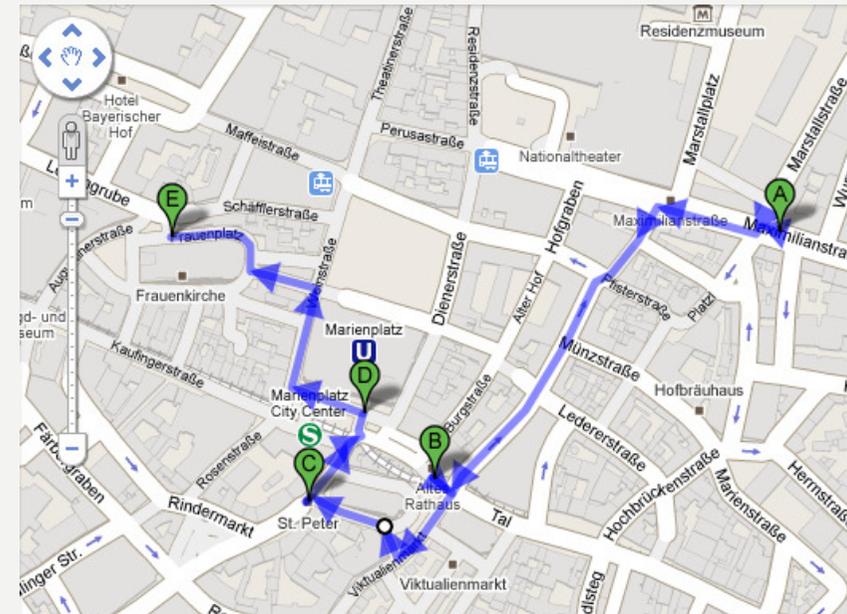


## Topic of the Thesis

- Online application that helps travellers to plan their city trips
- Combine information from different sources in one single application
- Recommend the user certain activities based on his own personal preferences
- Support the user in constructing routes for each day of the trip

YAHOO! TRAVEL

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Google™  
Maps[www.maps.google.com](http://www.maps.google.com)



# Overview

- Related Work
- Expert Interview
- Online Survey
- Application Design
- Interaction Design
- Workflow
- Outlook

## Related Work

- Carolis (2007): *MyMap - Generating personalized tourist descriptions*
  - Mobile application
  - Recommendations based on user preferences and the user's current context
  - UI: map containing icons for objects of interest, list of all objects displayed on the map, detailed description of selected object



Carolis (2007)

## Related Work

- **Sebastia (2008): *e-Tourism - a tourist recommendation and planning application***

- Recommendation of sights and attractions according to the user's preferences
- Let the user choose the sights he wants to visit
- System constructs a tour plan telling the user when to perform which activities
- No route provided, only time schedule for single activities



The screenshot shows a web application interface for "Tourism". The page title is "Recommendations of tourist sites". The user is logged in as "john". The interface displays a "Plan recommended for john !".

Time	Place
12:00 - 12:10	Go from Astoria Hotel to
12:10 - 13:10	Visit Lonja
13:10 - 14:10	Have Lunch
14:40 - 15:00	Go from Lonja to Valencia
15:00 - 16:30	Visit Valencia Port
16:30 - 16:45	Go from Valencia Port to
16:45 - 18:00	Visit Hemisferic

Sebastia (2008)

## Expert Interview

- Interview with an employee of the travel agency „Singer Reisen“
- Identification of different customer categories and different motivations to travel
- Important factors for city travellers: opening times, photos, map, so called „Must Haves“ of a city
- Non-important factors for city travellers: weather, exact routes for each day





# Online Survey

- Participants: 100
- Age: 21-65 (average age: 27)
- Gender: 46% male, 54% female
- Travel frequency: 3 times a year
- Planning duration: 5 days (40% on planning sights to visit)

0% ausgefüllt

## Part 1. Personal information

1. Age

2. Gender

Male

Female

3. Occupation

Student

Employee

Retired

Other:

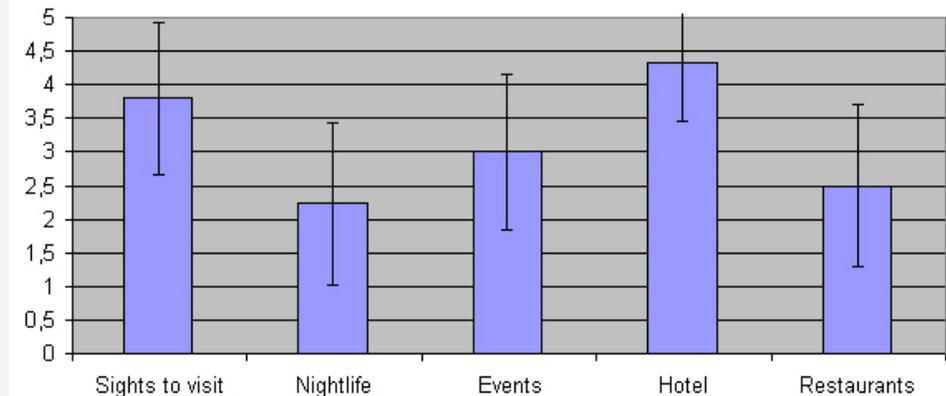
4. Nationality



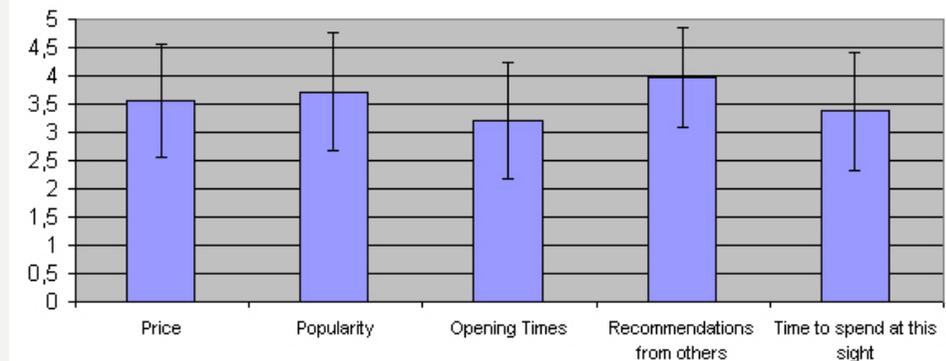
## Online Survey

- Planning before the trip:  
hotel, sights to visit
- Influence factors:  
recommendations from others,  
popularity
- Recommendation based on:  
personal interests, typical  
things for the city

Which things will you arrange during the city trip planning?

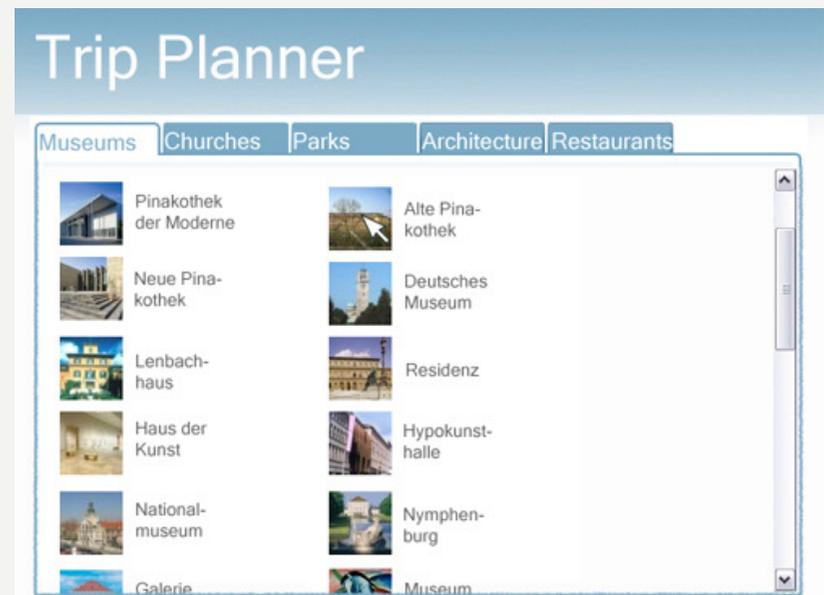
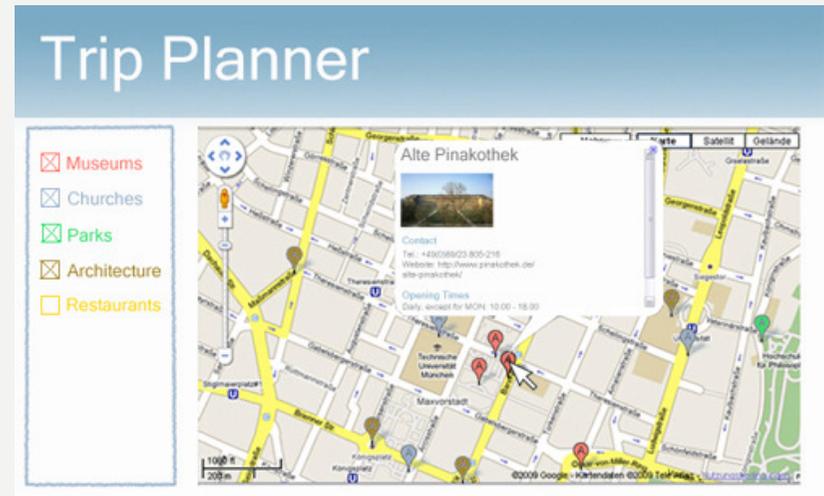


During the city trip planning, which factors influence your selection of sights?



## Online Survey

- User acceptance of filling out a short profile form
- UI visualization: display with map vs. display with list
- Route importance: very important, especially for female users
- Route visualization: display in a map with both sights and exact route





## Main Sources

- **Yahoo Travel**

([www.travel.yahoo.com](http://www.travel.yahoo.com))

- Title, address, description
- Opening hours, user rating, popularity

- **Google Maps**

([www.maps.google.com](http://www.maps.google.com))

- Address, coordinates
- Distance, duration

**YAHOO! TRAVEL** Search

Home Research TRAVEL GUIDES Book Deals Themes My Travel

Travel Guides > Munich, BY Overview | Hotels | Attractions | Restaurants | Reviews | Trip Plans | Map | Deals

SEARCH TRAVEL: [ ]

**Things to do in Munich (226)**

NEIGHBORHOOD	CATEGORY	LOCATED NEAR	NAME
<a href="#">Altstadt (60)</a>	<a href="#">Recommended (19)</a>	<a href="#">(MUC) FRANZ JOSEF...</a>	<a href="#">A</a> <a href="#">B</a> <a href="#">C</a> <a href="#">D</a> <a href="#">E</a> <a href="#">F</a> <a href="#">G</a>
<a href="#">Maxvorstadt And... (40)</a>	<a href="#">Museums &amp; Galle... (85)</a>	<a href="#">Deutsches Museum</a>	<a href="#">H</a> <a href="#">I</a> <a href="#">J</a> <a href="#">K</a> <a href="#">L</a> <a href="#">M</a> <a href="#">N</a>
<a href="#">Outside The Cit... (18)</a>	<a href="#">Tourist Attract... (82)</a>	<a href="#">Residenz</a>	<a href="#">O</a> <a href="#">P</a> <a href="#">Q</a> <a href="#">R</a> <a href="#">S</a> <a href="#">T</a> <a href="#">U</a>
<a href="#">Lehel (12)</a>	<a href="#">Galleries (52)</a>	<a href="#">Marienplatz</a>	<a href="#">V</a> <a href="#">W</a> <a href="#">X</a> <a href="#">Y</a> <a href="#">Z</a> 0-9
<a href="#">MORE</a>	<a href="#">MORE</a>	<a href="#">MORE</a>	

Choose an option above to narrow the results displayed below!

**SORT BY:** Popularity | Name [Show Revi](#)

**1 Residenz**  
  
 Neighborhood: [Residenz](#)  
 ★★★★★  
 10 Reviews  
 Add to It

**2 Deutsches Museum**  
 Neighborhood: [Residenz](#)

Map showing route between Residenz and Deutsches Museum in Munich.

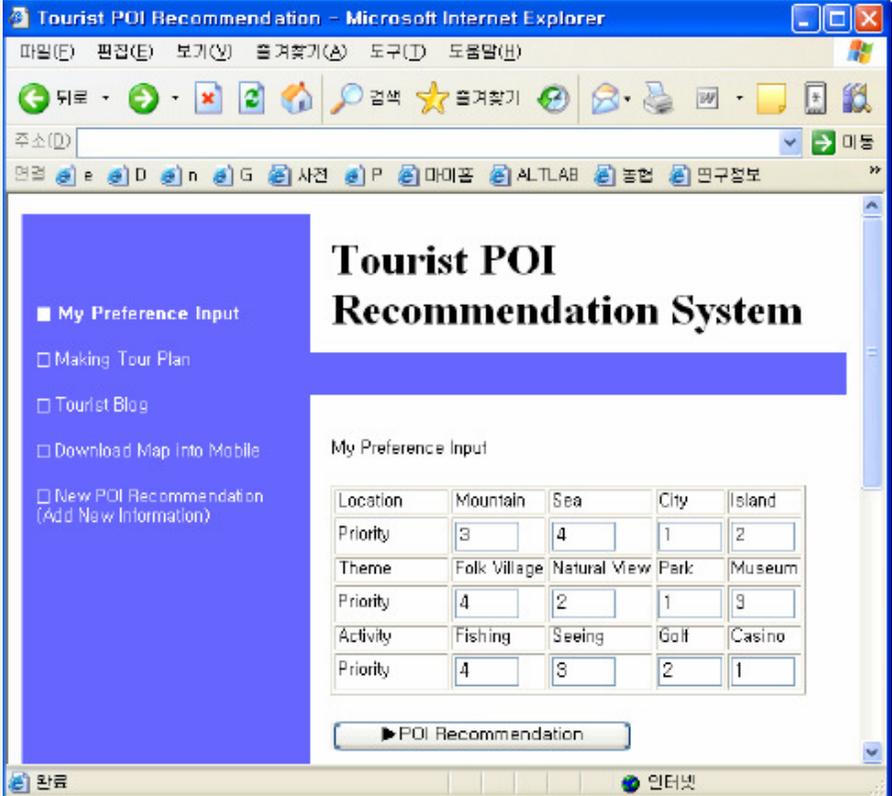
# Sight Recommendation

## • User preferences

- Input form where the user has to rate different sight categories
- Search for items according to the users preferences (content-based filtering)

## • History data (optional)

- Assume user preferences from history data, search for similar users (collaborative filtering)



**Tourist POI Recommendation System**

My Preference Input

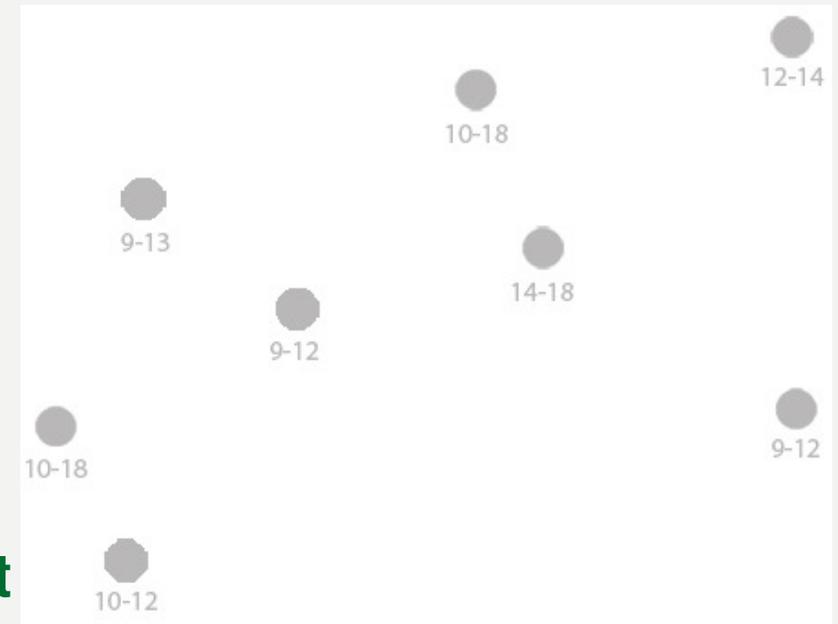
Location	Mountain	Sea	City	Island
Priority	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="1"/>	<input type="text" value="2"/>
Theme	Folk Village	Natural View	Park	Museum
Priority	<input type="text" value="4"/>	<input type="text" value="2"/>	<input type="text" value="1"/>	<input type="text" value="3"/>
Activity	Fishing	Seeing	Golf	Casino
Priority	<input type="text" value="4"/>	<input type="text" value="3"/>	<input type="text" value="2"/>	<input type="text" value="1"/>

Kang (2006)



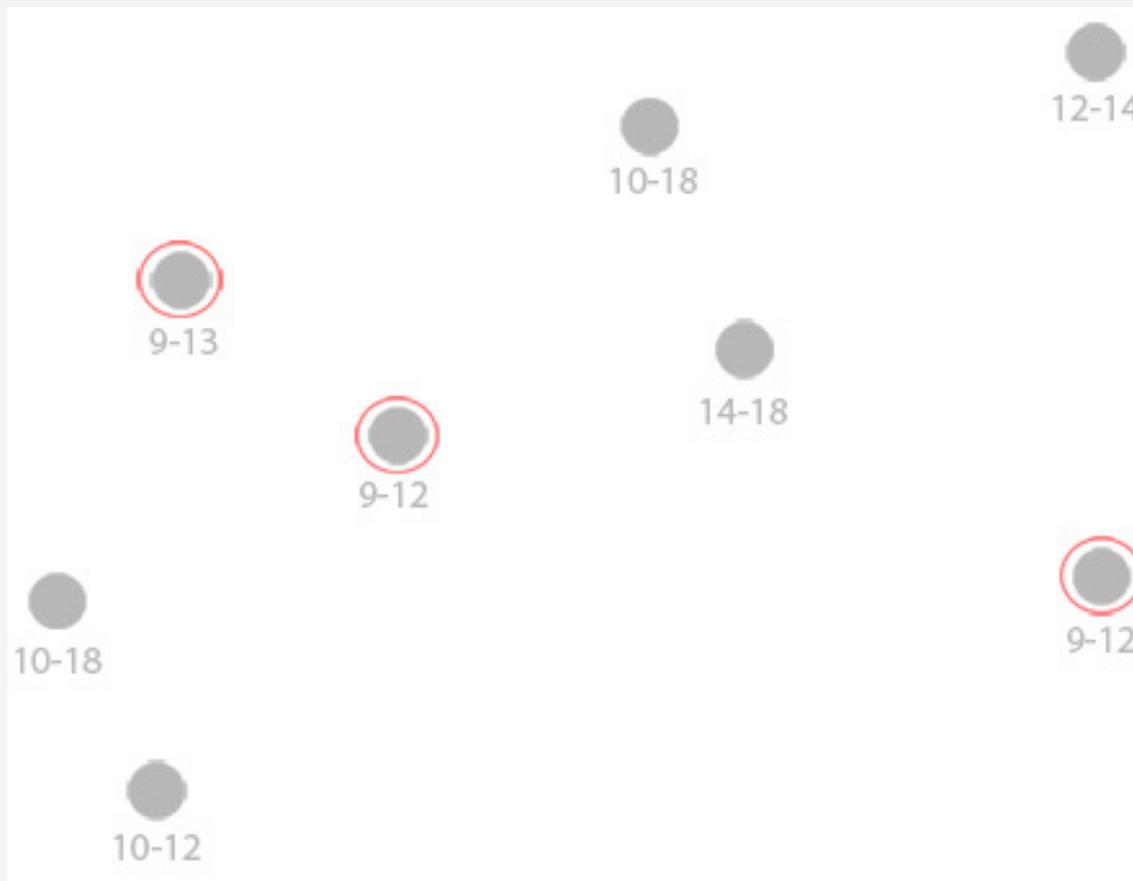
# Route Recommendation

- **Problem 1: Route Finding Algorithm**
  - System has to consider walking distances and opening times
- **Problem 2: User Interaction**
  - No reasonable way for the user to interact with the finished routes
- **Solution: Route Construction Support**
  - System suggests sights regarding the current time
  - User selects sights on his own
  - Route is constructed step by step





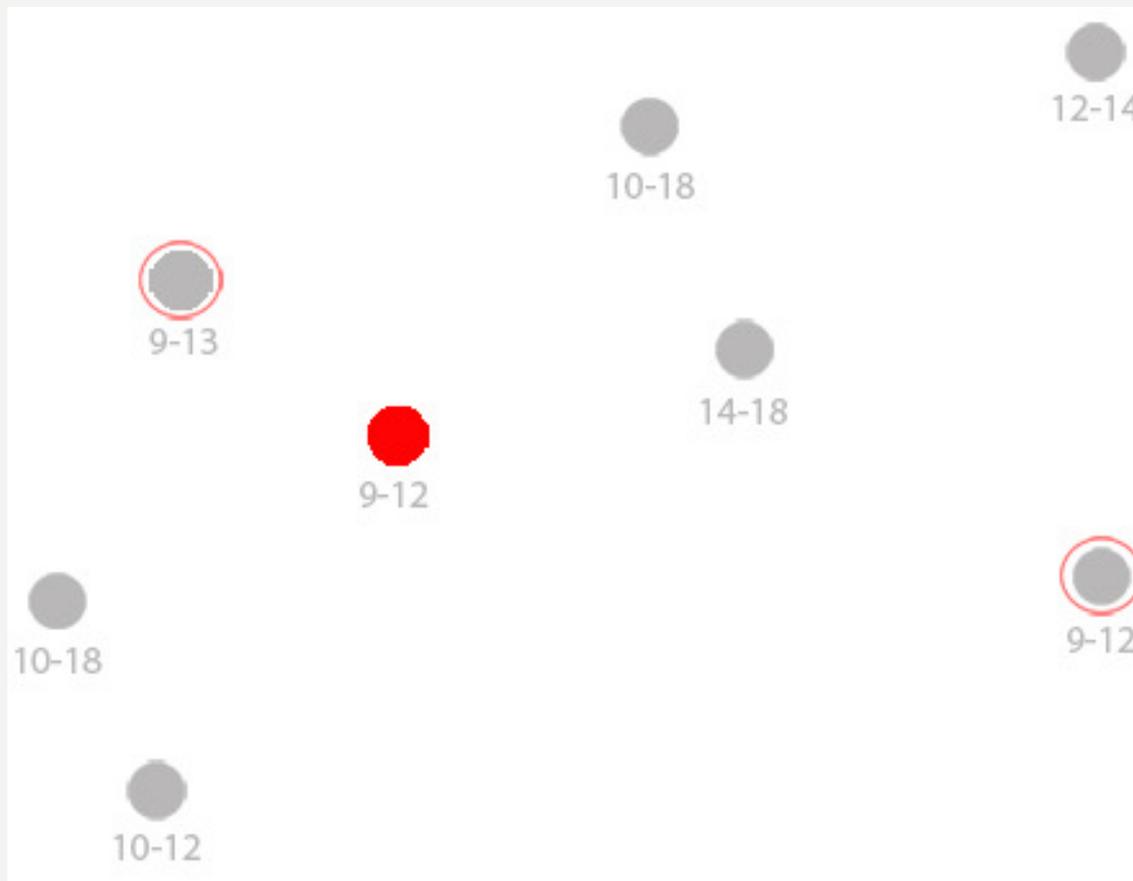
# Interaction Design – Step 1



Time: 9 am



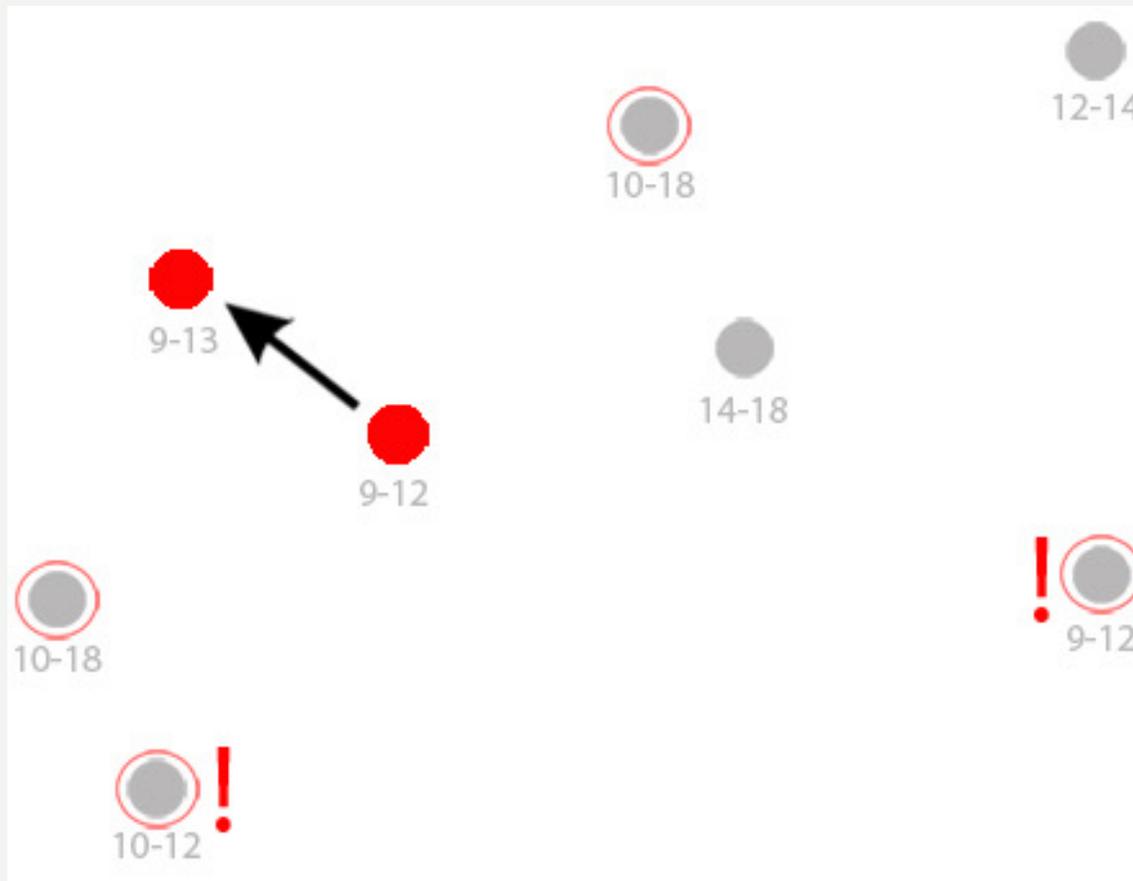
## Interaction Design – Step 2



Time: 9.30 am



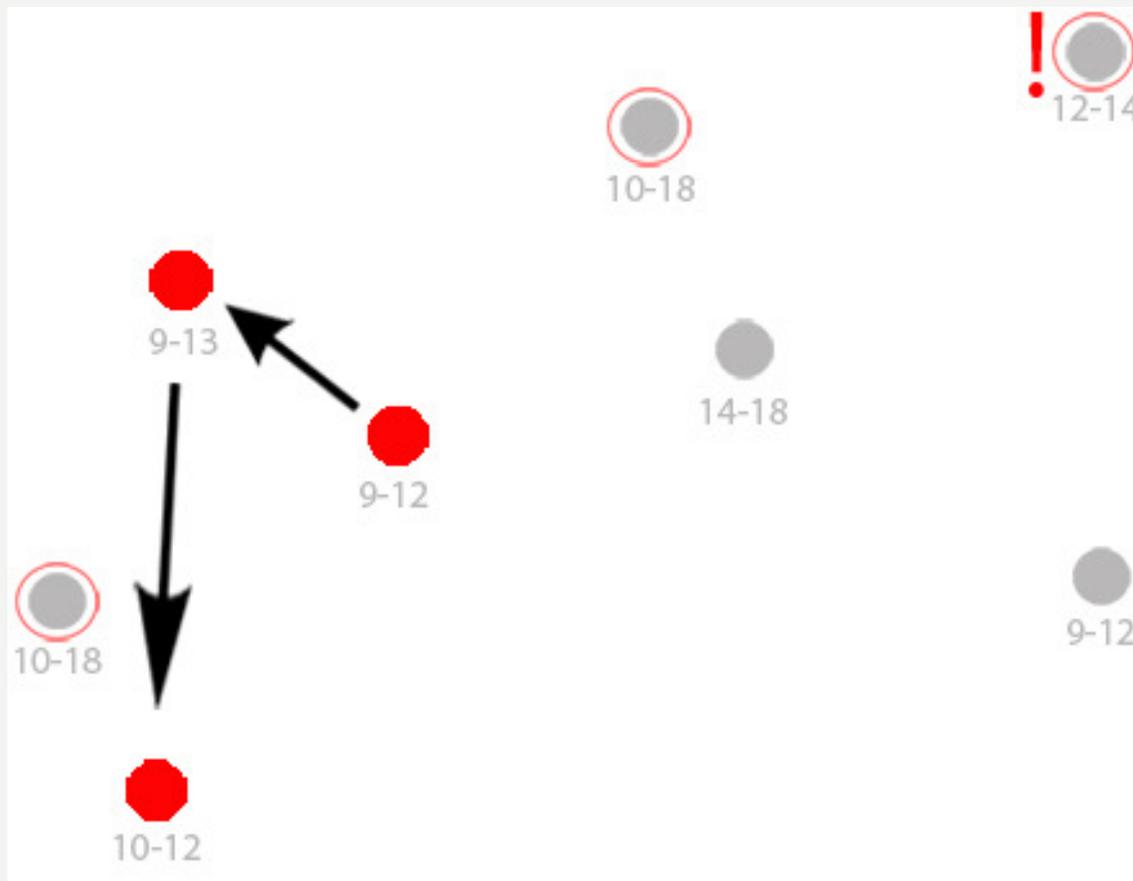
## Interaction Design – Step 3



Time: 10.40 am



## Interaction Design – Step 4

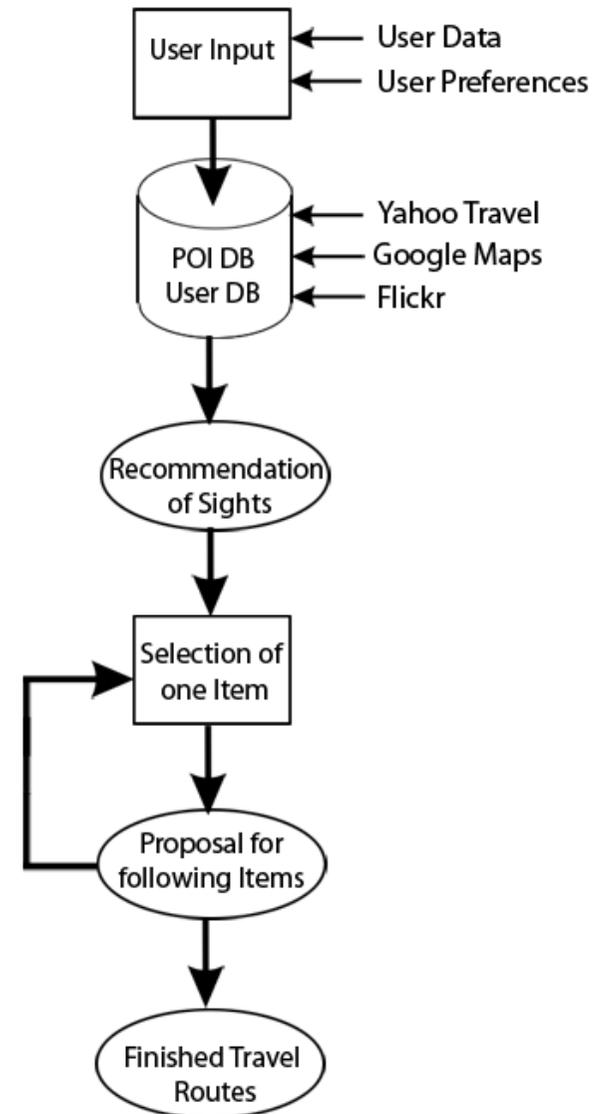


Time: 11.55 am



## Workflow

- User Input: user data, user preferences, search query, selection of items
- System Output: recommendation of sights, proposal for adequate items, finished travel routes





# Outlook

- Analysis of Existing Travel Systems and Guidebooks
- Research on Related Work
- Expert Interview
- Online Survey
- Workflow and Design of System
- **Implementation and Design**
- **User Study**
- **Formulation of the Thesis**



**Thank you for your attention!**