

# A Mobile LBS for Geo-Content Generation



Project Captain Kirk

Facilitating Users to Share, Rate and Access Information in a Novel Manner

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# Outline

- Motivation
- Objectives
- The Mobile Application
- User Studies and Results
- Conclusions

## Motivation

- Mobile applications typically offer access to ,basic' geo-content
  - Cannot be rated or extended with own information
- **Evidence** in the human sciences that **people** actually **prefer subjective information sources** for decision making
  - Experiences from friends an family
- Success stories of content communities (Wikipedia, Facebook, foursquare) confirms acceptance information systems that offer the potential to:
  - **Consume** and to
  - **Produce** personalized data

## Project Captain Kirk – Objectives

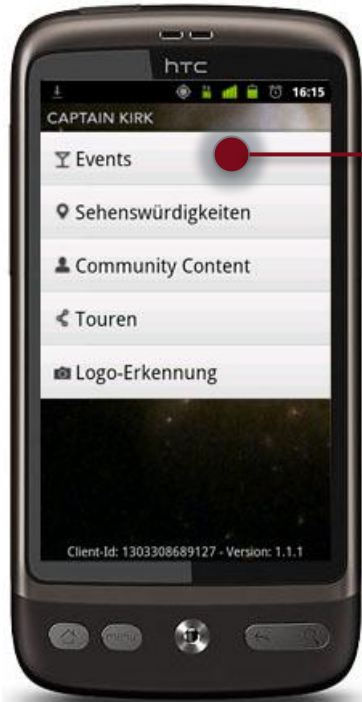
- A new approach for a mobile, interactive and integrated system
- Allow the users
  - To create geo-referenced data for themselves
  - To share data between community members
- Shared information consists of
  - Title
  - Description
  - Keywords
  - Image
  - Current location and time.
- Easy access to relevant information on mobile devices
  - Image, text and location based information retrieval
  - Item-based collaborative filtering for recommendations

# The Mobile Application

Android Application

# Accessing information – Events, Sights, UGC

Home Screen



Filter Selection

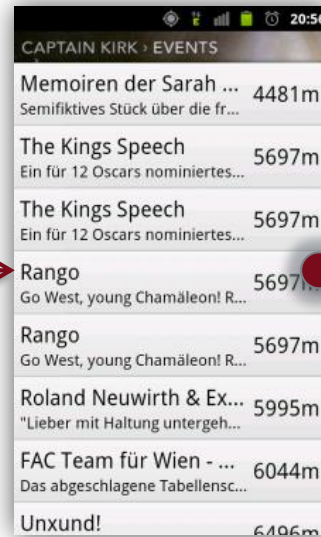


by Recommendation

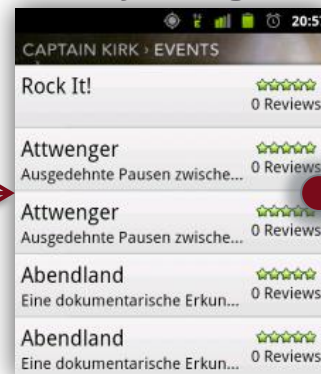


Collaborative Filtering

Filtered List by Category



by Rating

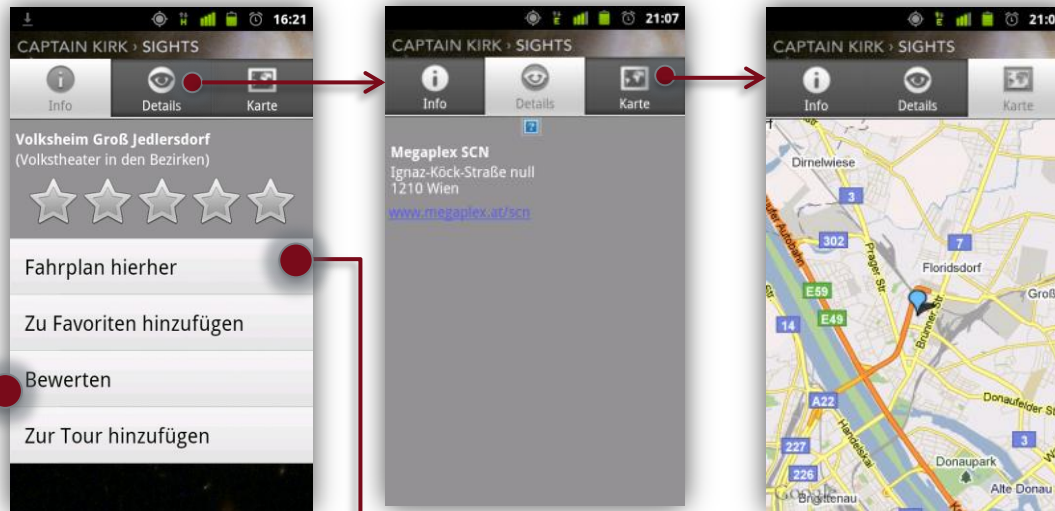


Detail View

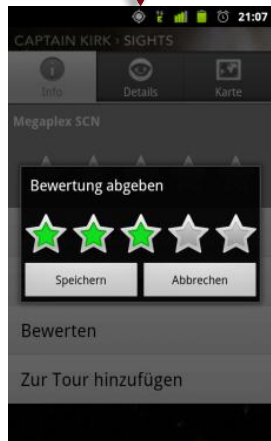


# Detailed View

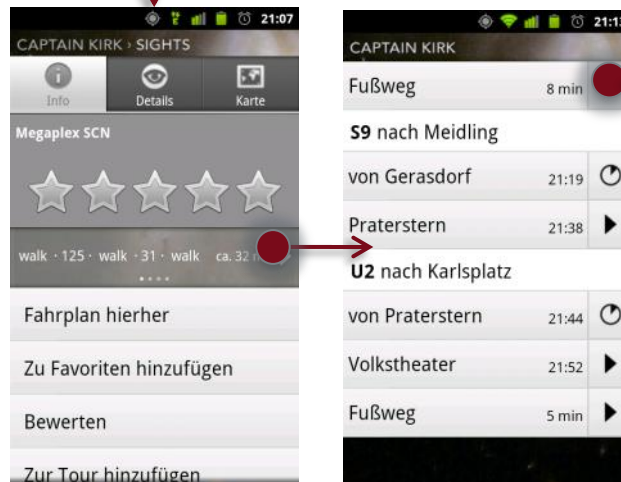
## Detail View Tabs



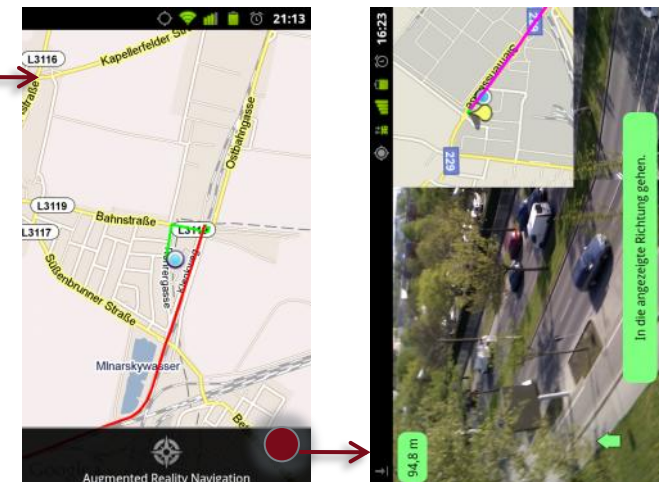
## Rating



## Routing

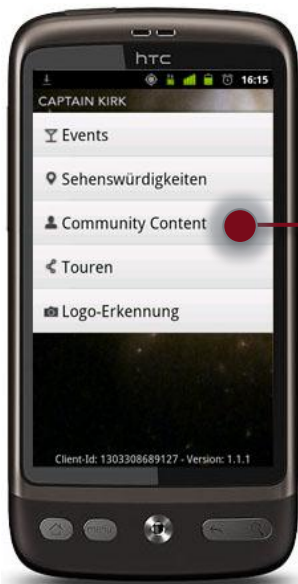


## Map & AR Navigation



# User Generated Content Creation

## Home Screen



## Input

Title, description, keywords



## Keywords

Enter new, or select from List



List with most frequently used keywords in the surrounding

## Photo

Add from Galery or take a new Photo



# Field Test

## Field Test

- The hypothesis of the study
  - People prefer subjective information sources for decision making.
  - Information systems such as content communities meets the requirements to consume and produce such personalized information.
- Questions
  - Will people share information and their experiences using a mobile location based service?
  - Are the users supported properly by the developed system?

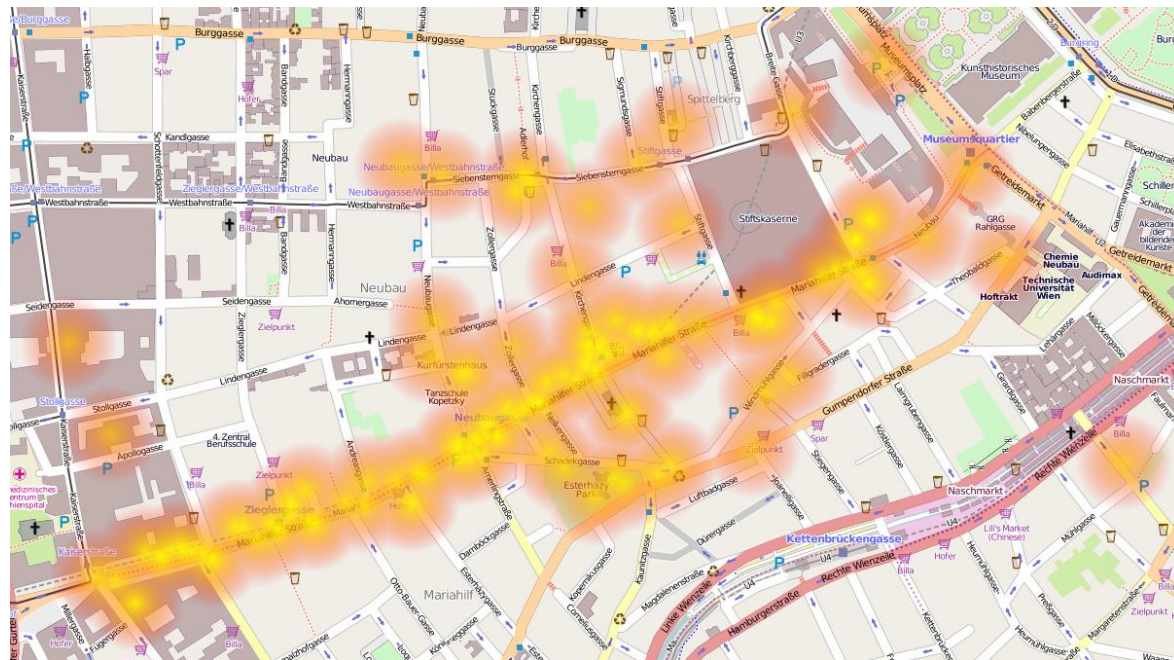
# Field Test Design

- **Mariahilfer Strasse in Vienna**
  - 6<sup>th</sup> district, the section between Neubaugasse and Zieglergasse
  - A very popular shopping area
- **Exemplary content**
  - Events, sights, reference logos for object recognition and community content was prepared.
- **Tasks**
  1. Retrieve information about events, sights and community content
  2. Make use of the routing service
  3. Create at least 10 new content entries
  4. Rate at least 20 entries
  5. Test the object recognition with shop logos
  6. Evaluate the augmented reality navigation
  7. Online questionnaire with 48 questions to gather information from the users about their skills, experience, preferences and opinion

# Results

# Results – User Generated Content

- 12 Respondents
- 137 new entries
- 156 entries in total are in the database
- Content can be used to create semantic maps



Heat map over all keywords showing the spatial distribution of UGC

## Detailed Results

- Title text length
  - 2 the shortest
  - 30 the longest
  - **11.68** characters in average (median 11)
  
- Description text length
  - 3 the shortest
  - 102 the longest
  - **23.07** characters in average (median 20)
  
- Keyword length
  - 221 keywords in total
  - 2 the shortest,
  - 24 the longest
  - **6.7** characters in average (median 6)

Keeping in mind the **difficulties entering text on smartphones**, it was **interesting** to analyse the **number of characters** used for community content.

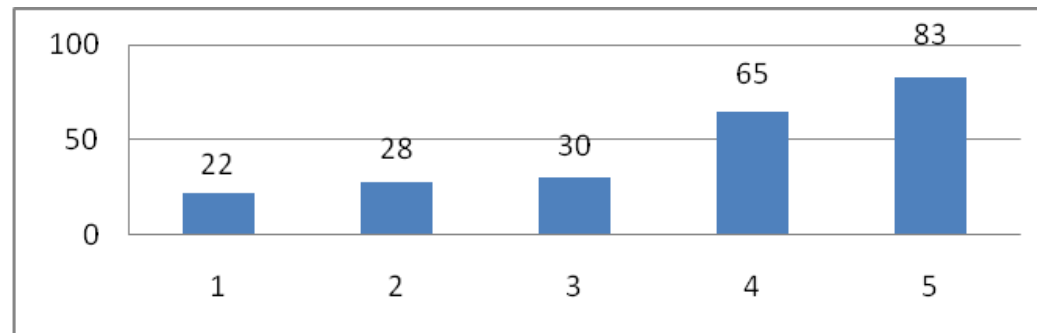
# Keywords

- 221 in total
- 149 unique
- Top keywords
  - “bar” 9 times
  - “restaurant” 8 times
  - “cafe” 7 times

tanz sport schoko krank souvenir swords  
snack **sushi** bier flying rat vegetarian  
bread theater spielerei lokal **japan**  
fountain city bankomat delka ubahn koziol  
asien **shopping** pasta brief bildschirm  
pizza geschirr reise buchladen rental  
spass art spielzeug vorhänge geschäfte  
fast food eröffnung park ruhe ino  
postkasten bike apotheke octagon klettern  
muw thalia books schmuck radgeschäfte  
gesundheits lustige sehenswürdigkeit  
sehenswürdigkeiten city bike station  
kickboxing libro bekleidung boardgames  
super **cafe** hotel atm straßenbahn  
tisch bahnhof boardgame public  
**fastfood** junk rpg eisenwaren hello kitty  
dragon einkaufen store shopping center  
statue cinema wc optiker solinger shop  
audio fish zoo kirche kino bäcker  
museum kfc war telekom bahn flohmarkt  
beauty bank rad schuhe blades hut  
exquisite wellness englisch gesundheit  
lifestyle telefon uhren möbelgeschäft  
**bar** backwaren comics reparatur fahrrad  
shopping elektronik kleidung italy  
renovation **restaurant** **haus**  
konditorei american name gassen  
öffentliches wc brille citybike **drogen**  
english sweets cool kleidung werkzeug  
tankstelle taekwondo essen icecream  
handy arbeit figurines firma chicken  
lebensmittel stoffe vendor martial arts  
pizzeria fortbewegung mq

## User Ratings

- Personalization is the key to many successful services.
- User's were asked to rate community content
- Recommendations are made out of the ratings (collaborative filtering)
- Crucial point that users make a lot of ratings
  - Not only for very good items, giving five stars
  - Also to give lower ratings to find dislikes



Distribution of the rating values 1 (bad) to 5 stars (good), total 228 ratings.



# Conclusions

- AR navigation
  - Showed faster orientation in foreign environments
  - Respondents have found their way faster than using a 2D map visualisation
- Information retrieval
  - Sorting based on ratings and recommendations were perceived useful
  - Logo recognition using images was a further novel way to access information and showed satisfying performance
- From the questionnaires it can be concluded
  - Most of the participants rated the application as “useful”
  - Willing to use the application in future if some improvements will be made

# Issues

- User want control over entries
  - Maintain entries like changing or deleting
  - Control access similar to Facebook or Google+ (friends only, ...)
- Entries describing events
  - Possibility to set an expiration date
  - Entries will be removed automatically from the repository after expiration
- Rating
  - People want to make comments on their ratings
- Keywords
  - Vocabulary emerges organically from the tags chosen by individual members
  - Reduction of the growth of keywords having a similar meaning could improve the performance for information retrieval

# Issues

A group of 12 test users is:

- Large enough to discover the most significant difficulties
- Will have a strong bias and cannot not be seen as representative about content
- But gives a glue of possible use cases and types of information people tend to share in communities

# Project Partners & Funding

- Partners
  - AIT Austrian Institute of Technology
    - Community content and spatial analysis
  - Joanneum Research
    - Object recognition and AR navigation
  - Fluidtime
    - Android client application
  - Wiener Linien
    - Real-time public transport schedule information
  
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# Thank you for your attention!

Questions Please!

