Towards supporting wayfinding
LBS components

1. Mobile devices
2. Communication Network
3. Positioning Component
4. Service and Application Provider
5. Data and Content Provider
Navigation

• Car navigation, pedestrian Navigation

Google Map Navigation

Wikitude Drive
Mobile guides

Mobile Augmented Reality
- Combines camera, GPS and orientation sensors
- Enables mass market augmented reality
- 3G phones can embed these components

AR+Wikipedia=Wikitude

Nokia: Mobile Augmented Reality Applications
Location-based game

Geocaching: a worldwide game of hiding and seeking treasure.

A geocacher can place a geocache in the world, pinpoint its location using GPS technology and then share the geocache's existence and location online. Anyone with a GPS device can then try to locate the geocache.

http://www.geocaching.com/iphone/
Social networking

Foursquare: check-in
Pedestrian Navigation
Master Plan

1 Sensor Fusion
2 Ubiquitous Infrastructure
3 Behaviour Modelling
4 Semantic Wayfinding
5 Landmark Taxonomies
6 Context-Awareness
7 Keyhole Effects
8 Communication and Interfaces
9 Pragmatic Wayfinding
Data acquisition and Modeling
Collaborative Filtering
Augmented Reality and Social Media
# Behaviour modelling

<table>
<thead>
<tr>
<th></th>
<th>Cluster 1</th>
<th>Cluster 2</th>
<th>Cluster 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>f: 40%</td>
<td>f: 36%</td>
<td>f: 67%</td>
</tr>
<tr>
<td></td>
<td>m: 60%</td>
<td>m: 64%</td>
<td>m: 33%</td>
</tr>
<tr>
<td>Age</td>
<td>~ 30</td>
<td>~ 35-40</td>
<td>~ 30-35</td>
</tr>
<tr>
<td>Duration of observation</td>
<td>~ 5 min</td>
<td>~ 10 min</td>
<td>~ 23 min</td>
</tr>
<tr>
<td>Speed</td>
<td>~ 1.2 m/s</td>
<td>~ 0.6 m/s</td>
<td>~ 0.2 m/s</td>
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<tr>
<td>Number of stops</td>
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<td>1.4</td>
<td>3.6</td>
</tr>
<tr>
<td>Duration of stops</td>
<td>7 sec (max. 1 min)</td>
<td>2.5 min (max. 8 min)</td>
<td>4.7 min (max. 17 min)</td>
</tr>
</tbody>
</table>
Semantic Wayfinding

Urban area in situ experiments in Vienna and Salzburg, oral descriptions of environment and possible actions

Ski touring
additional experiments for comparison
SemWay

- "Gehen Sie an der Felsformation links vorbei im Tal hinauf."
..engineering the semantic dimension
Ways2navigate
Keyhole Problem
FemRoute, Fem2Map

How do the psychological route qualities attractiveness, convenience and safety depend on the context of use?
EmoMap

Considering the emotional perception of space in navigation systems for pedestrians

**Project goals**

1. Gathering relevant parameters from pedestrians for creating an *emotional layer* of Vienna
2. Contributions via VGI to an open online database - [OpenEmotionMap.org](http://OpenEmotionMap.org)
3. Using collected data for improving/personalizing pedestrian navigation
Hypothesis

- The strength of emotional attachment for a particular landmark, place or space embedded in memory, by an individual, influences our structuring of space, thus our “identity building” and “well being”
Concept

applying crowdsourcing methods using state-of-the-art tools/social media
correlate with psychological findings

Evaluate (focus groups, CF)
App

- Android Platforms
- OSM
- GPS location
- downloadable from cartography.tuwien.ac.at
Openemotionmap.org
International Cartographic Association
International Cartographic Association

mission

de the **world authoritative body** for cartography and geoinformation science
International Cartographic Association

mission

world authority means

national and affiliate members

represented at UN bodies and other international organisations
International Cartographic Association
Aims

- Understanding and solve world-wide problems using cartography
- Informing about environmental, economical, social and spatial information through mapping
- Promote professional methods, techniques and solutions
- Global forum on cartography
- ..
International Cartographic Association

Commissions

Commission on Art and Cartography
Commission on Atlases
Commission on Cartography and Children
Commission on Cartography in Early Warning and Crisis Management
Commission on Cognitive Visualization
Commission on Data Quality
Commission on Digital Technologies in Cartographic Heritage
Commission on Education and Training
Commission on Generalisation and Multiple Representation
Commission on Geoinformation Infrastructures and Standards
Commission on Geospatial Analysis and Modeling
Commission on Geovisualization
Commission on GI for Sustainability
Commission on the History of Cartography
Commission on Map Design
Commission on Map Production and Geo-Business
Commission on Map Projections
Commission on Mapping from Remote Sensor Imagery
Commission on Maps and Graphics for Blind and Partially Sighted People
Commission on Maps and Society
Commission on Maps and the Internet
Commission on Mountain Cartography
Commission on Neocartography
Commission on Open Source Geospatial Technologies
Commission on Planetary Cartography
Commission on Theoretical Cartography
Commission on Ubiquitous Mapping
Commission on Use and User Issues
International Cartographic Association

Commissions

International Cartographic Association
Instruments: Publications
International Cartographic Association
Instruments: Maps (Exhibitions, Awards)
International Cartographic Association
Instruments: Research Agenda

Geographic Information
Metadata and SDI
Geospatial Analysis and Modelling
Usability
Geovisualisation
Map Production
Cartographic Theory
History of Cartography and GI Science
Education
Society
International Cartographic Association
Instruments: Conferences

International Cartographic Conference
August 2013, Dresden, Germany
www.icc2013.org
International Cartographic Association
Instruments: Conferences

International Cartographic Conference
August 2015 Rio de Janeiro, Brasil