# How good is good enough?

## understanding granularity in location-aware computing

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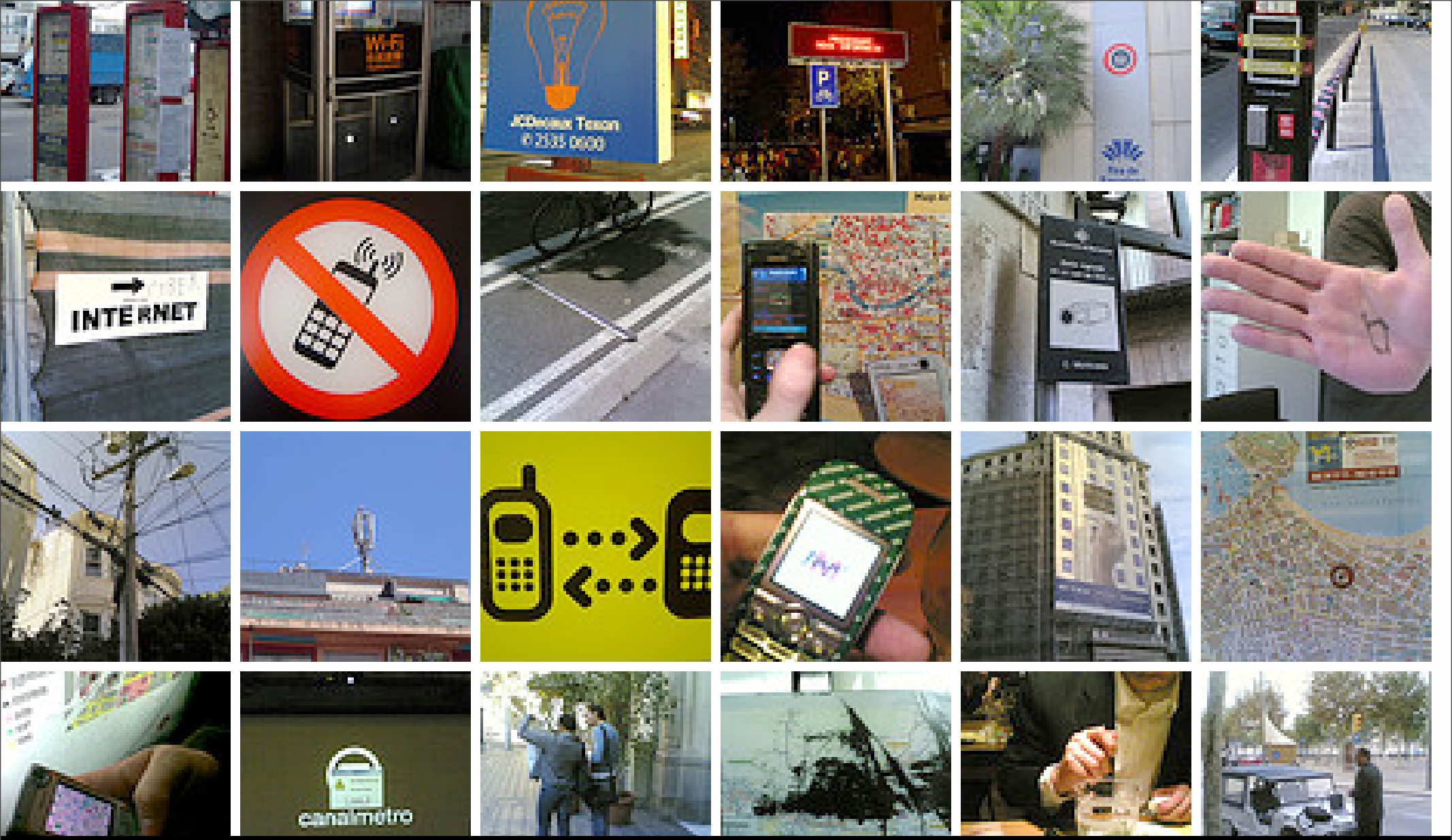
Brownbag seminar at the giCentre, London, January 23, 2008

# my profile

- PhD candidate at the Universitat Pompeu Fabra, Barcelona.
- affiliated to the MIT SENSEable City Lab
- software engineering
- human-computer interaction
- urban planning (pretentious!)




# urban computing

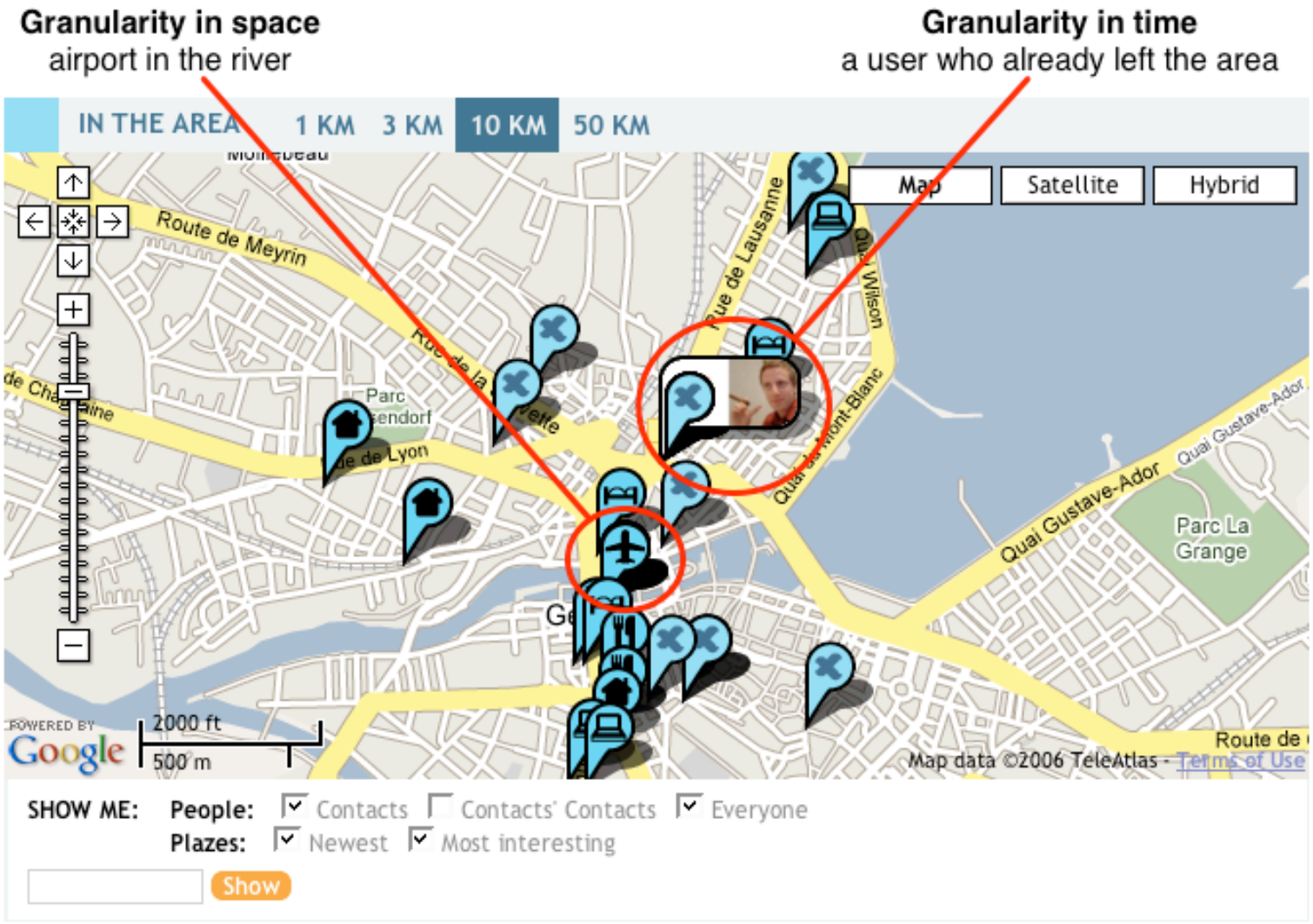
ubicomp, people, city

# location-aware computing

# issues

- **quality**: sensors (accuracy, noise, gaps)
- **timeliness**: network (latency, connectivity) location update protocol, decay function
- **representation** (quality of geographic data, metaphors)

# example


Granularity in space
airport in the river
Granularity in time
a user who already left the area
IN THE AREA
1 KM
3 KM
10 KM
50 KM
Map
Satellite
Hybrid
Route de Meyrin
Rue de Lausanne
Quai Gustave-Ador
Parc La Grange
Parc
Quai du Mont-Blanc
2000 ft
500 m
Map data ©2006 TeleAtlas - Terms of Use
SHOW ME:
People:
Contacts
Contacts' Contacts
Everyone
Plazes:
Newest
Most interesting
Show

# consequences

- gap between what we expect and what the location-aware system delivers
- spatial uncertainty
- spatial cloaking

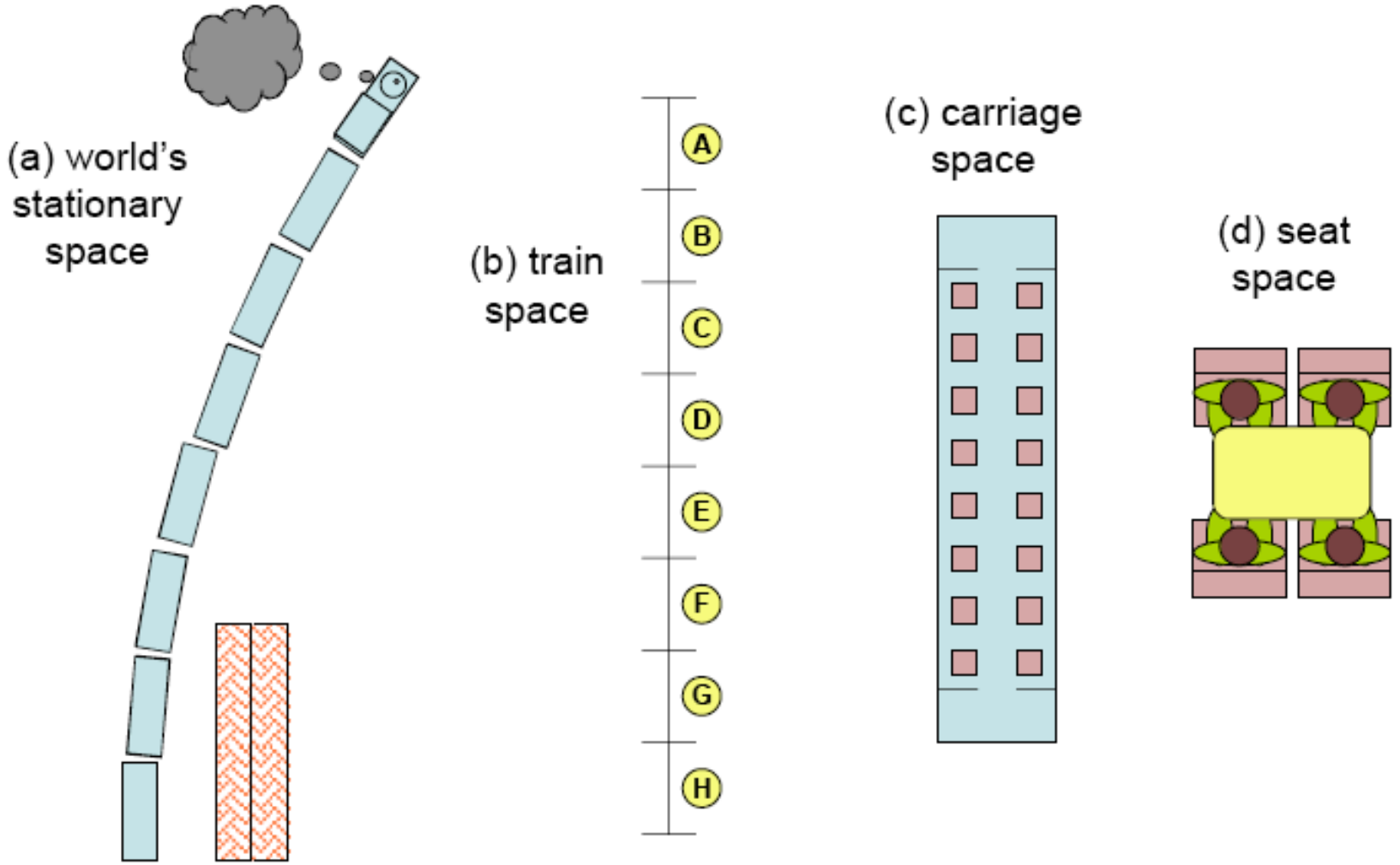
# don't throw the technology at the problem!

*“Let’s do smart things with stupid technology today, rather than wait and do stupid things with smart technology tomorrow?”*

William Buxton

# granularity

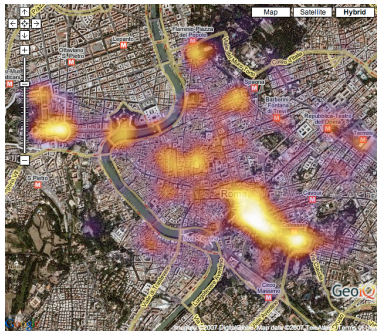
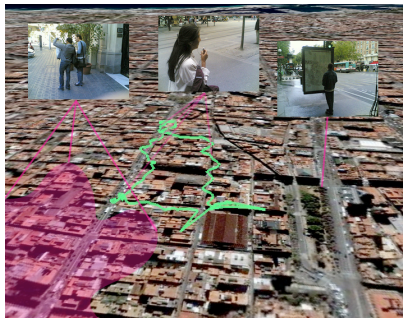
people have their own perception of the space that often does not match with technological or administrative definitions



# socio-technical gap

How the deliver the appropriate granularity of location information?



social-technical gap in location-aware computing

**location information granularity & spatial uncertainty** → **informed suggestions** → **design strategies** → **data collection and evalutation**

*mixed, exploratory (CatchBob!)*
*descriptive, exploratory (flickr)*
*ethnographic, exploratory (taxi drivers)*

seamful design
*uncertainty visualization*
*middleware design*
*spatio-temporal traces*

mixed approach, field study
ethnography supported by spatio-temporal data analysis tool
usability: does it work, where does it work? when and compared to what does it work?

# building evidences

ECOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

# CatchBob!

Nicolas Nova, Fabien Girardin, Pierre Dillenbourg
Center for Research and Support of training and its technologies (CRAFT)
Swiss Federal Institute of Technologies Lausanne (EPFL)

Images : Ecole des Arts Décoratifs de Genève

# CatchBob! outcomes

- Various players reactions to uncertainty: Believing, not understanding, overcoming
- Various sources of spatial uncertainty
- Players without a location awareness tool took better advantage of the annotation feature
- Automatic location-awareness ≠ Giving a location (act of communication carrying intentions)

# some outcomes

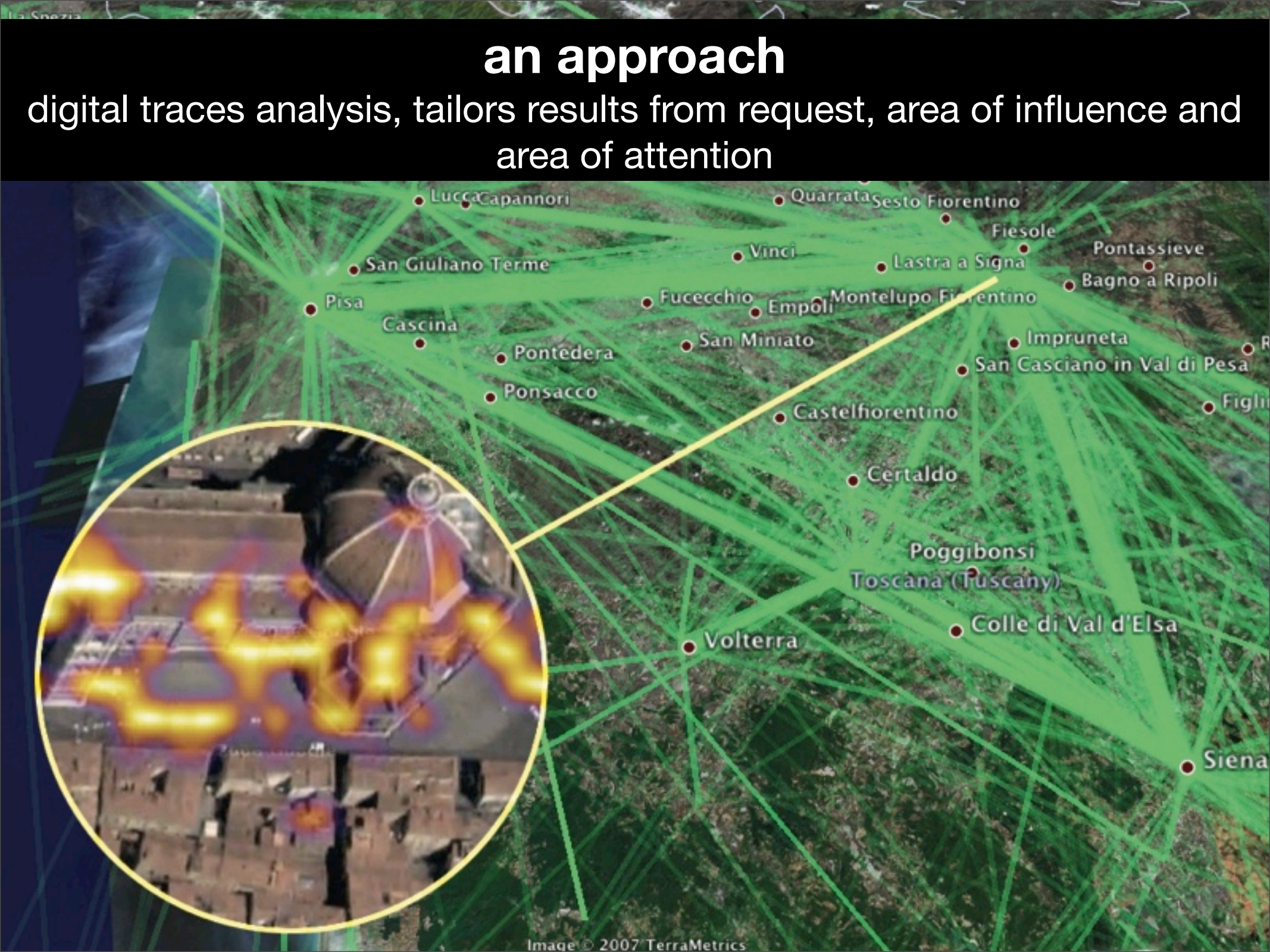
- influence of the experience on the appropriation, novices experience uncertainty, seniors increased tranquility

- multiplicity of the sources of information (satnav, “guia”, customers, radio, mobile phone), access depending on the complexity of the space and points of reference.

- location information trunking during wayfinding (importance of granularity)

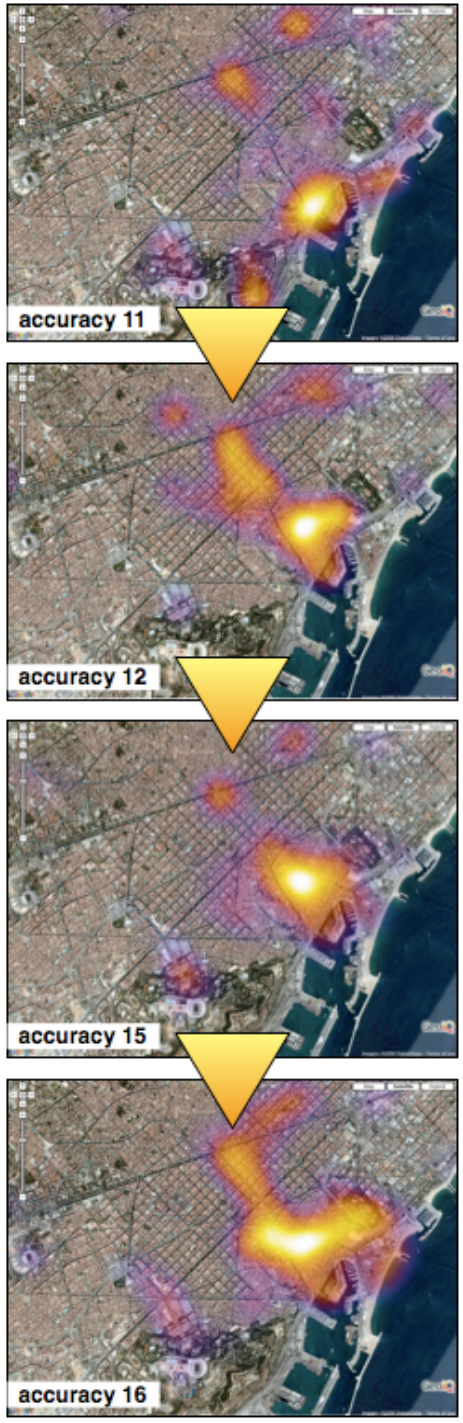
# an approach

digital traces analysis, tailors results from request, area of influence and area of attention

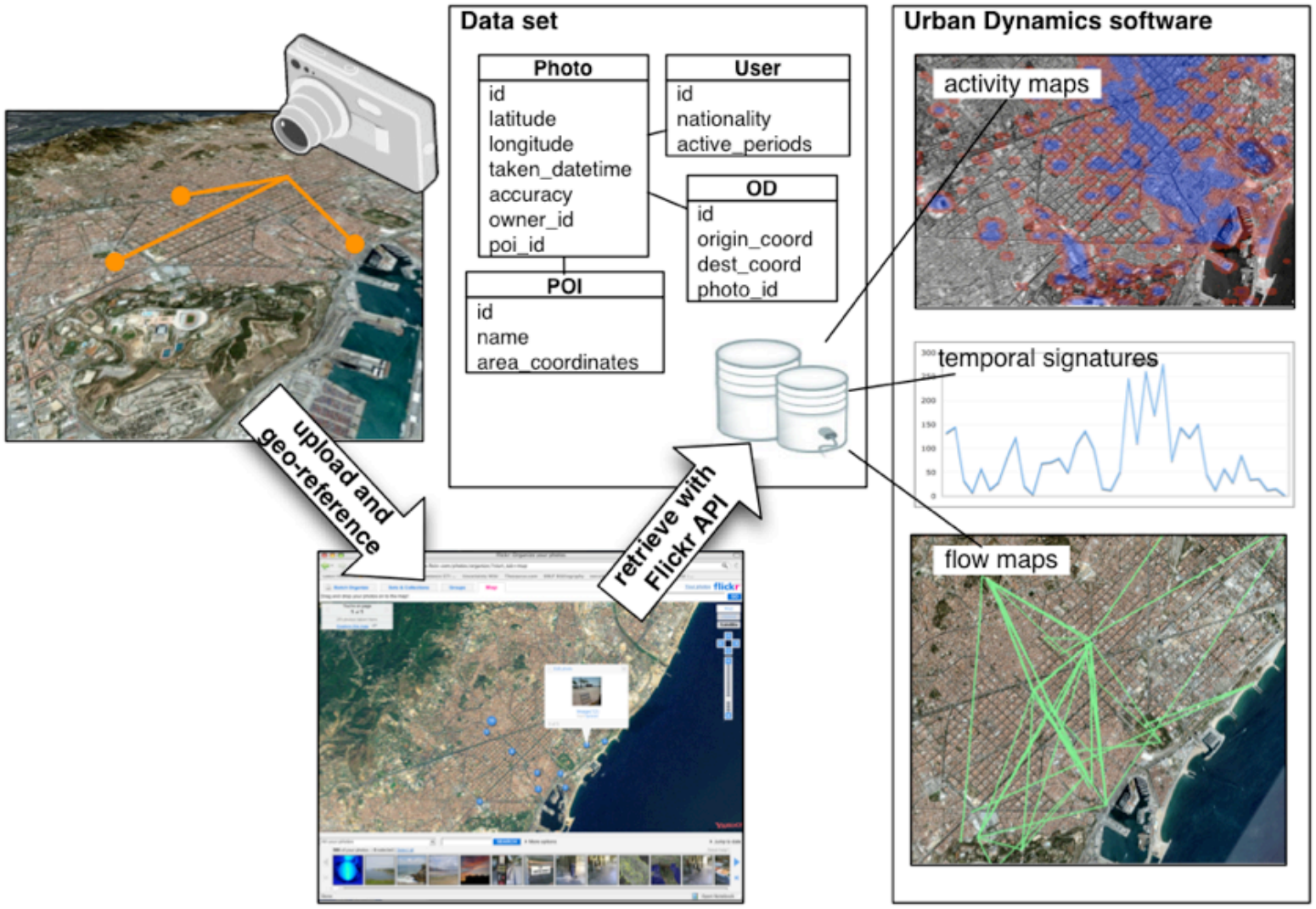


# leverage digital footprints

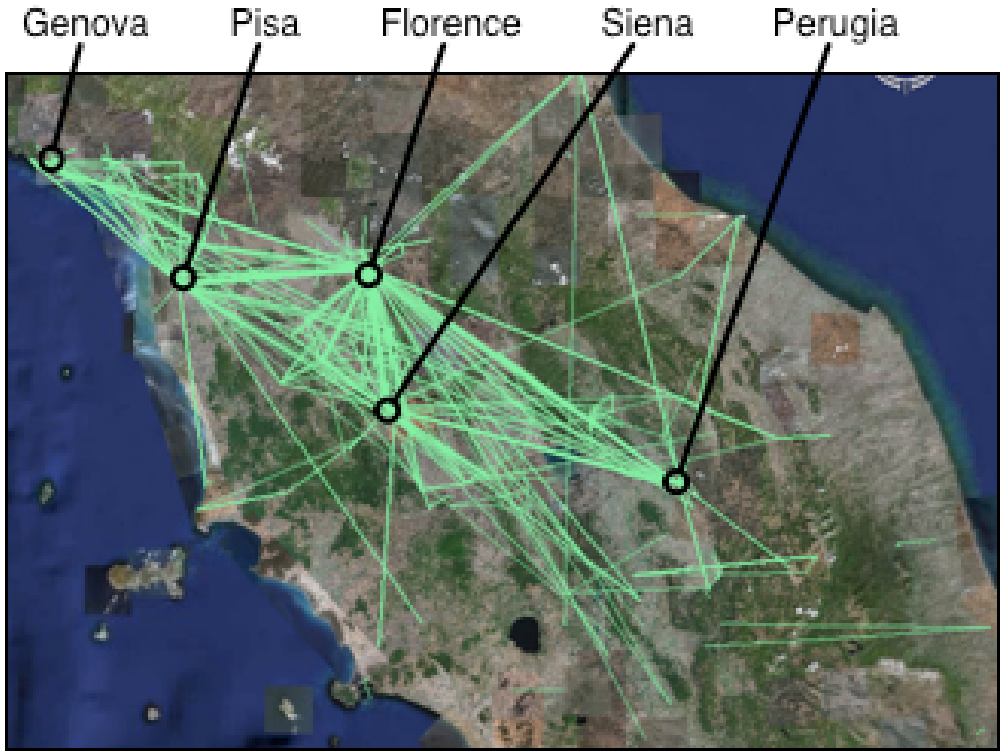
- ongoing study of Flickr georeferenced photos
- study the use of granularity in geotagging
- semantic description (e.g. multiple spaces)
- understanding mobility and activity

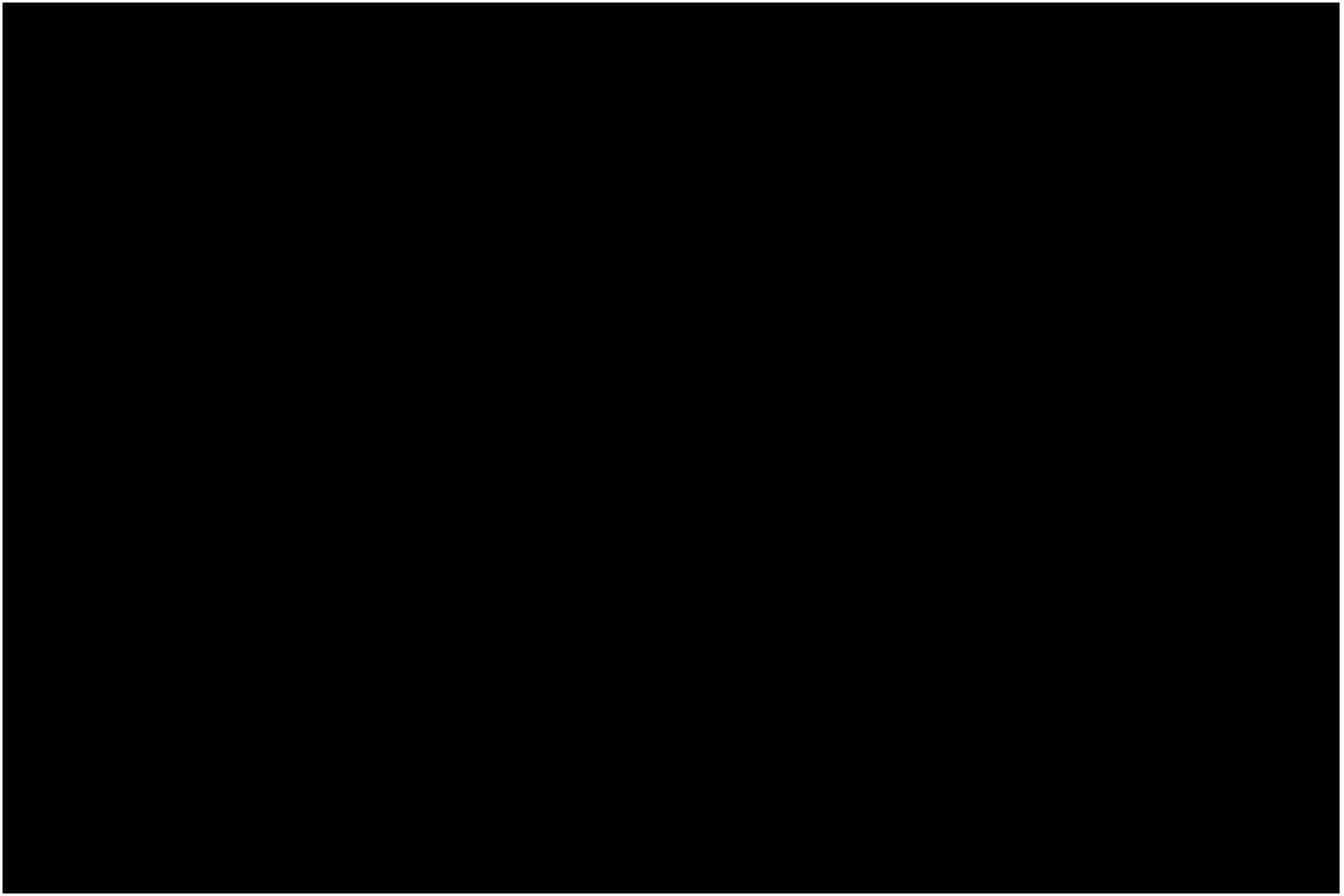


# tracing the visitor's eye



# geographic relevance



# inform the design of location-aware systems

**now**

- hard to grasp a context. lack of temporal understanding of space.

**digital footprints**

- use position history to tailor results from requests for information further
- help define a human-based geographical relevance (e.g. define a neighborhood such as “downtown”)
- define area of attention of a user and area of influence of a landmark

# evaluation


**WikiCity and Wireless City**
enhance the resident and tourist experience

# thank you

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