Contemporary Research in *HCI*

Fabien Girardin
Pompeu Fabra University, June 8, 2007

outline

- a research field

- methods

- topics

- examples

- emerging tracks

raison d'être

- Research in HCI provides knowledge and methods for the design of usable computer systems

- but to ensure that this knowledge is applied successfully by those who design and build computer systems

- **However**... no consensus in the discipline as to the research strategy and methods by which this can be achieved

HCI as a ...

- **science**: emphasis on theory and what is happening, hypothesis-testing experiments.

- **design science**: artifact theory, interpretation and evaluation of these artifacts in the context of real use, observation-invention.

- **engineering discipline**: engineering/human factors. Aims at optimizing the man-machine fit

HCI as a ...

- **science**: explain reality and how it is happening, hypothesis-testing, experimentation

  > **ability to apply this research to the design of novel products?**

- **design science**: artifact theory, interpretation and evaluation of these artifacts in the context of real use, observation-invention.

- **engineering discipline**: engineering/human factors. Aims at optimizing the man-machine fit

HCl as a ...

- **science**: explaining reality and behavior. Is happening, hypothesis-testing, experiments
  - **ability to apply this research to the design of novel products?**

- **design science**: artifact theory, interpretation and evaluation of these artifacts in the context of real use, observation-invention
  - **accuracy of the observation? unscientific?**

- **engineering discipline**: engineering/human factors. Aims at optimizing the man-machine fit

approaches to research

quantitative	qualitative	mixed
cause and effect thinking	theory or pattern building	consequence-oriented, problem-centered
measured observations with experiments and surveys	open-ended data collection. narratives, ethnography, case studies	both qualitative and quantitative information

interdisciplinary

- computer science

- psychology (e.g. human perception, human memory, cognitive sciences)

- sociology (e.g. anthropology)

- artificial intelligence (e.g. machine learning)

- computer graphics (e.g. infoviz, knowledge viz)

- design (e.g. interaction, information, graphics)

interdisciplinary

- computer science

- psychology (e.g. human perception, human memory, cognitive sciences)

- sociology (e.g. anthropology)

Hard to have contributions accepted by each community!

- artificial intelligence (e.g. machine learning)

- computer graphics (e.g. infoviz, knowledge viz)

- design (e.g. interaction, information, graphics)

flirting with...

- artists

- designers

- engineers

- "hackers"

growing pains

Some revealing current debates (at CHI 2007):

- relation with designers

- how to interpret the probes?

- what is wrong with HCI prototyping

- re-thinking humans, computers, interaction, and design

- "who killed design?"

- evaluation of real-world deployments

- evaluating evaluation

ACM SIGCHI 2007

tracks

Attention and interuption

Medical

Task and attention

tasks

collaboration at work

distributed interaction

ubicomp tools

mobile kits and stuff

emergency action

Expert/novice

location-aware systems

security

programming by professionals

on the move Mobile application

video

mobile interaction photo sharing

games

large displays

mobile interaction techniques

tags, tagging and notetaking online representation of self

Face and bodies interaction

Novel navigation

tangibility web usability

innovative interaction

empirical studies
of web interaction

multimodal interactions

empirical models

input techniques gaze and eye tracking

capturing life experiences

home spirituality

people, looking at people

design theory

design methods

emotion and emphathy designing for specific cultures

politics and activism

learning and education

Education and culture

themes

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Design design methods

Emotions

emotion and emphathy

designing for specific cultures

politics and activism

learning and education

Society

Learning

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today

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Design   design methods

Emotions

emotion and emphathy   designing for specific cultures

politics and activism   learning and education

Society   **Learning**

Education and culture

content annotation, photo sharing, tagging

Why We Tag: Motivations for Annotation in Mobile and Online Media (Ames et al.)

- problem: people do not tag -> understand the tagging behavior

- method: qualitative study ("photo elicitation", borrowed from anthropology)

Why We Tag: Motivations for Annotation in Mobile and Online Media (Ames et al.)

- suggested tags to engage in the activity

- people do not care much about explaining their photos to strangers

- they do not care much about helping their friends find particular photos.

- taxonomy of drivers to tagging

		Function	
		Organization	Communication
Sociality	Self	* Retrieval, Directory * Search	* Context for self * Memory
	Social	* Contribution, attention * Ad hoc photo pooling	* Content descriptors * Social Signaling

innovative interaction, physical-virtual hybridization

surface computing

- Wow!... Great multi-touch, direct manipulation but:

- Beware: *if the only tool you have is a hammer, you will see every problem as a nail*

- HCI research: engage people in using natural hand gestures. Integration into the home or specific activities.

location-aware systems, mobile interaction, collaboration

Bridging the Social-Technical Gap in Location-Aware Computing
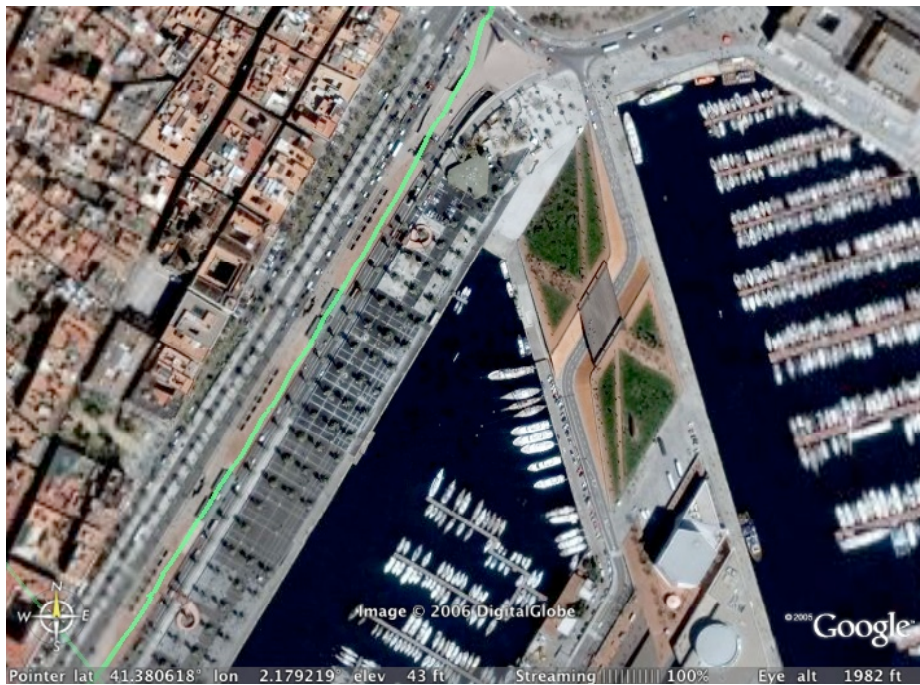
problem statement
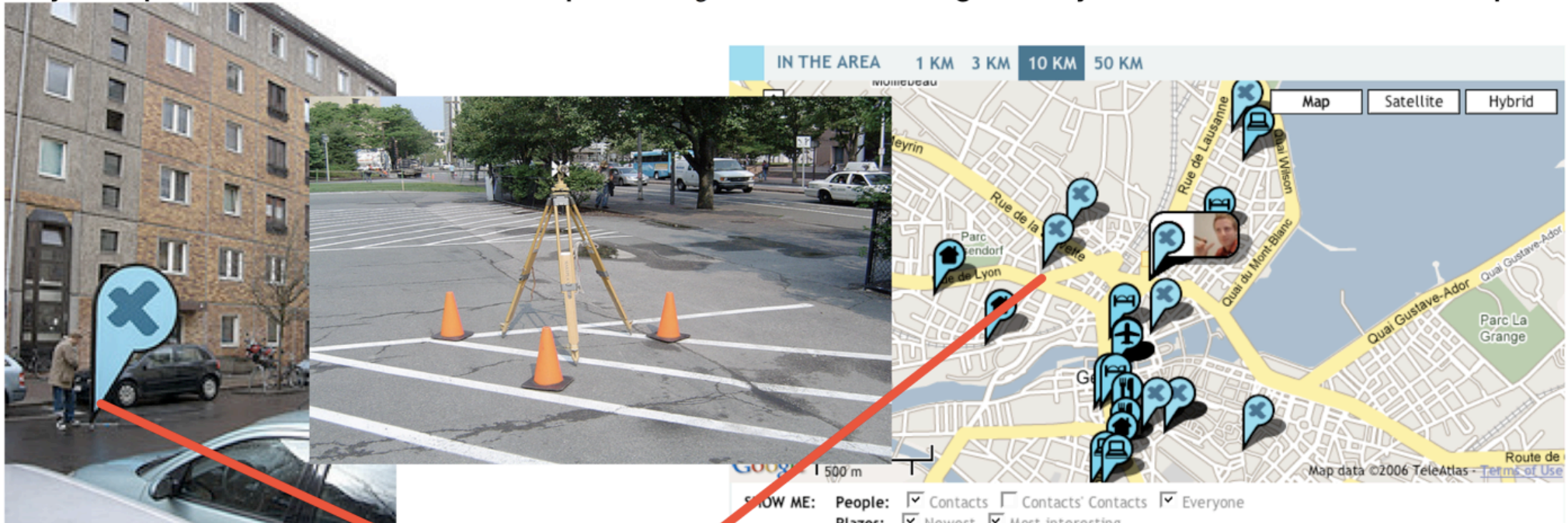
research questions

How to build a collaborative location-aware system that takes into account the spatial uncertainty inherent to ubiquitous technologies?

- what level of location information quality and timeliness must be delivered in order to be useful and relevant?

- what parameters influence successful spatial uncertainty visualization?

- what is the balance between implicit and explicit forms of human interaction with a location-aware system that communicates the inherent uncertainty of its location information?

approach
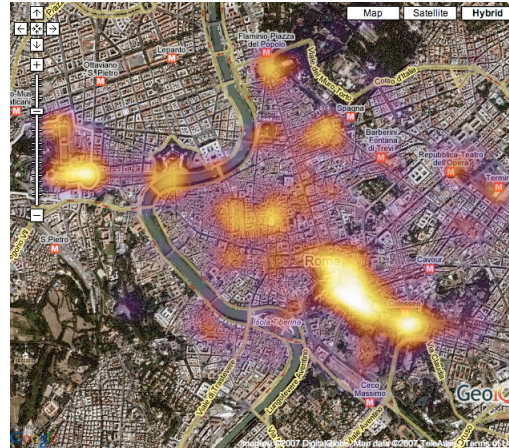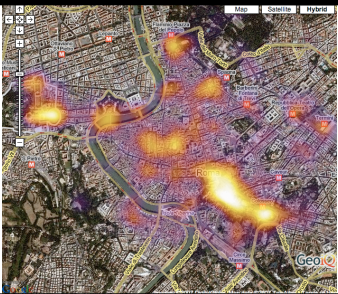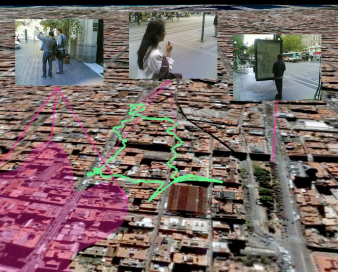
case studies of the
ubicomp of the present

deploy real-world
field experiments
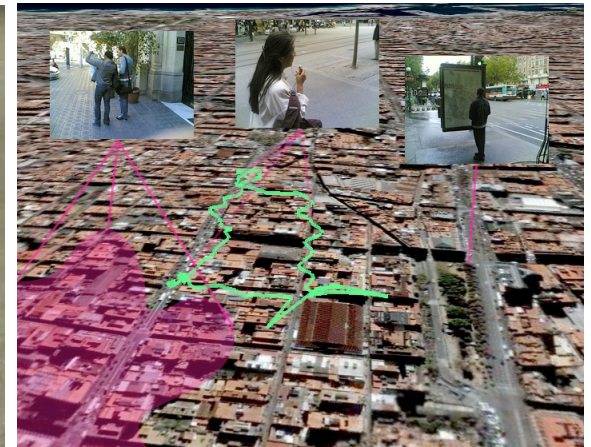
articulation

Type	Context	Objective	Method
Field experiment 1		Explore the sources of spatial uncertainty and analyze players' behaviors towards spatial uncertainty	mixed, exploratory
Case study 1		Identify the uses of location information granularity	descriptive, exploratory
Case study 2		Identify the main issues when a location-aware system does not match expectations (co-evolution)	ethnographic, exploratory
Field experiment 2		Analyze the integration of location information granularity in the design of the application. to evaluate strategies to manage spatial uncertainty.	mixed

motivation

"Let's do smart things with stupid technology today, rather than wait and do stupid things with smart technology tomorrow?"

William Buxton
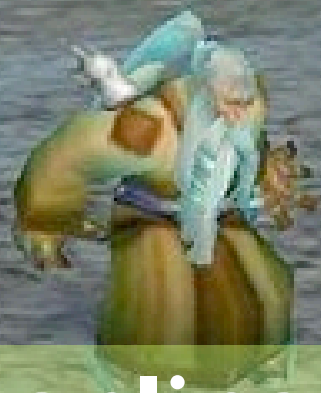
gaming, collaboration, online communities

online gaming communities

- use games to observe group dynamics online

- what tools and techniques could be used to better support gaming communities.

The Social Dimensions of Multiplayer Online

<u>video</u>

Alone Together? Exploring the Social Dynamics of Massively Multiplayer Games (Ducheneaut et al.)

- Quantitative observational: more than a year of data collected from five World of Warcraft servers

- outcome: there might be a hard limit on the size of a viable organic group online, possibly set at around 35 group members or less.

- offer collaboration infrastructure

other emerging *tracks*

- Research in HCI provides knowledge and methods for the design of usable ~~computer systems~~ **everyware**

- human-robot interaction

- corporate ethnography

every*ware*

- information processing embedded in everyday objects dissolving in behavior

- new notions of presence, privacy, awareness and reputation springing up around the use of these systems

- changes the design and evaluate interaction ("graceful degradation", self-disclosing, seamful as default, opting out, overhead)

human-robot interaction

AUR: a Robotic Desk Lamp by Guy Hoffman

click to play...

human-robot fluency and nonverbal behavior
non-anthropomorphic

<u>Video</u>

corporate ethnography

High-tech companies are deploying ethnographers and anthropologists by the score to study how people actually use technology

anthropology at Nokia

- *"We do this research work to inform and inspire the design stage. To bring designers into the field so they know whom they are designing for."*

- uses to which people put their phones (context of the culture and landscape)

- for example: how illiterate people use a mobile phone

- output: informed opinions, impact assumptions, patents

Where's The Phone? Selected Data

1549 participants, 11 cities, 4 continents

Jan Chipchase, Cui Yanqing & Fumiko Ichikawa

NOKIA

Where is the phone?

- 1549 participants in 11 street surveys on 4 continents

- understand where and why people carry their mobile phones

- the extent to which they notice incoming communication

- results: male 60% in trousers pockets, female 60% in bags. 30% of pocket and 50% of bags miss phone call

- study belts, cover

emerging opportunities

- healthcare

- aging population

- urban computing

- education