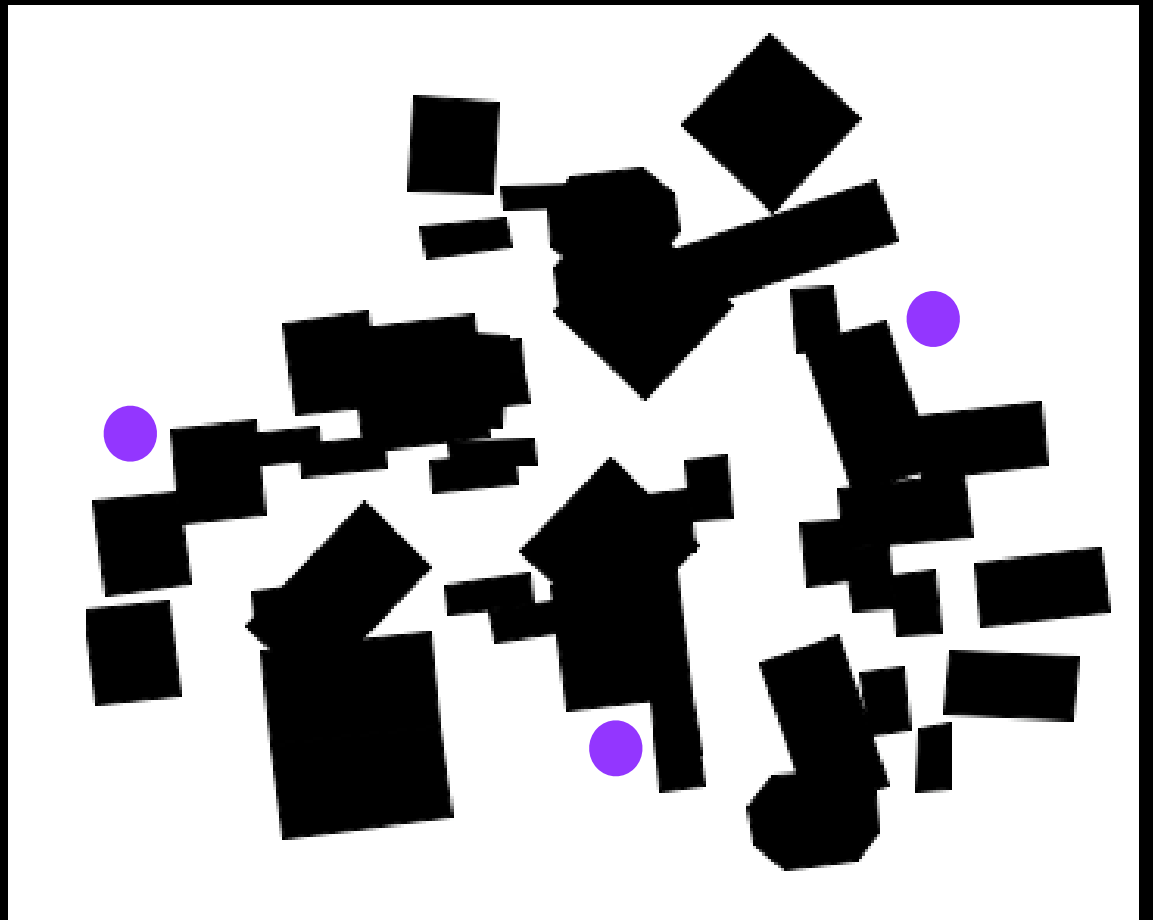
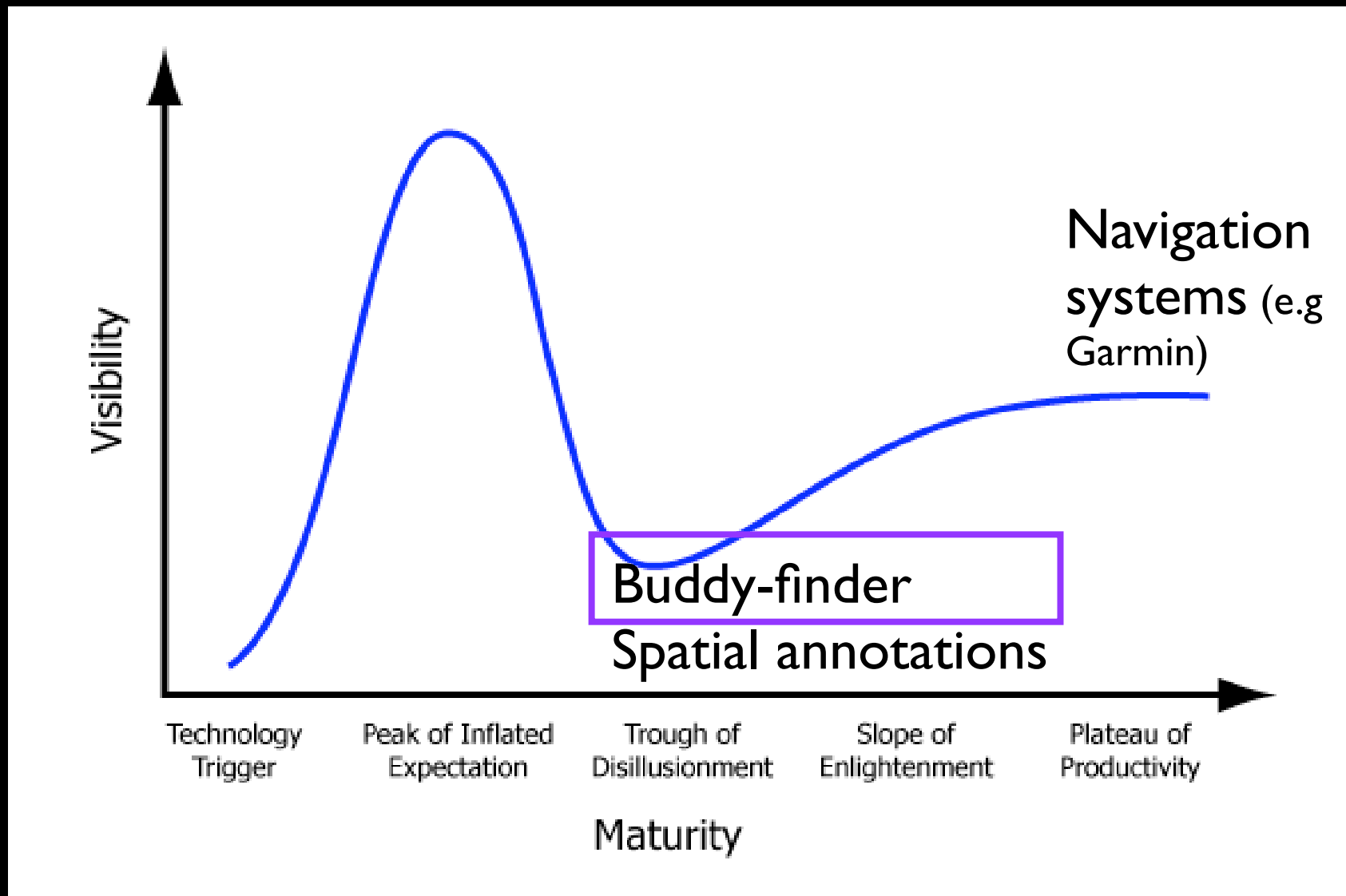


The User Experience of Location-Awareness

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Media and Design Lab, EPFL
Mediamatic, May 2007



2007 - Where we are



I took the Gartner Hype cycle and given the reasons I will describe afterwards, location-aware application are in the “disillusion gap”.
In this talk, the focus will mostly be on the buddy-finder applications, even though what I am criticizing also applies to other kinds of location-aware systems.

"Location-aware service integration into applications began. A critical mass of network and device support will occur through 2006."

Gartner, 2003

"Once devices were location-aware, business applications were expected to take advantage of the capabilities in the next two to five years"

Gartner, 2006



A proximal future...
...infinitely postponed?

Consultants/trendwatchers/analyst keep repeating the same predictions for 4-5 years... but they postpone the proximal vision of location-aware services. Something is wrong here. My hypothesis is that the user experience of such applications is problematic. This talk is about the limits and how to go beyond them.

1. What is wrong with location-aware applications

2. How to move forward

This talk has 2 parts. The first part is about the problems, it's mostly based on the work conducted in my Phd, either in terms of experiments I carried out or meetings/workshops/critical reviews. The next part is more speculative

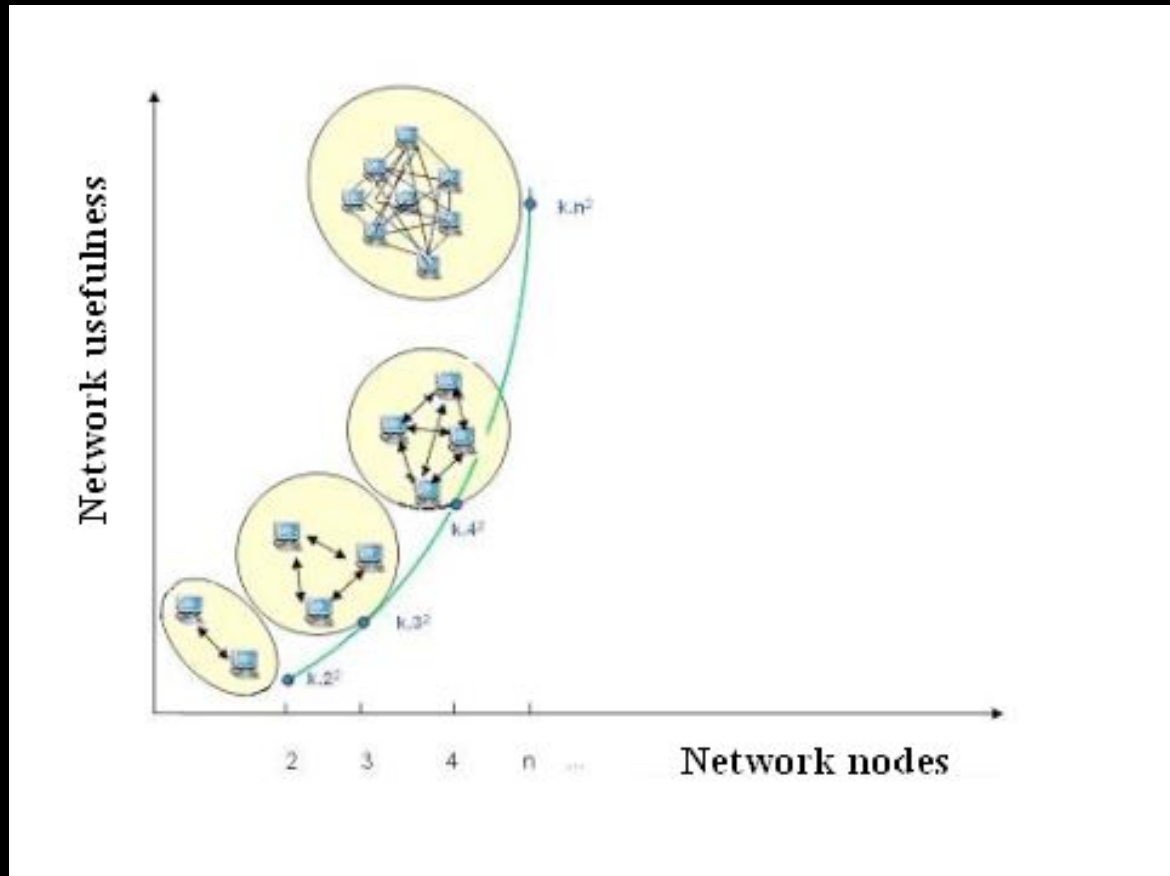
Problem 1

PRIVACY

The most important issue with regards to location-awareness is privacy. People want to know others' location but not to give theirs (From a user study by Skyhook Wireless, while the young generation have no problem exposing their life online (like we discussed), they are more reluctant when it comes to disclose their location). One of the issues is to whom we are providing that information and for what purposes. These tools generate potentially sensitive information. This then leads to difficulties in the social acceptance of MLA technologies in terms of user rejection or reluctance to employ certain features.

Problem 2

Difficulty to have a critical mass



hardware + software fragmentations + carrier “walled gardens”

The second problem = hardware + software fragmentations + carrier “walled gardens” make it difficult to reach a critical mass of users... it's indeed difficult to reach cluster effect, Metcalfe Law
Metcalfe's law states that the value of a telecommunications network is proportional to the square of the number of users of the system. Even though the notion of “value”/usefulness is vague, this model is interesting to explain usage of multi-user applications

Problem 3



The broken cloud of connectivity

Transitions operating smoothly, seamlessness, invisibility, calmness are often believed to be true



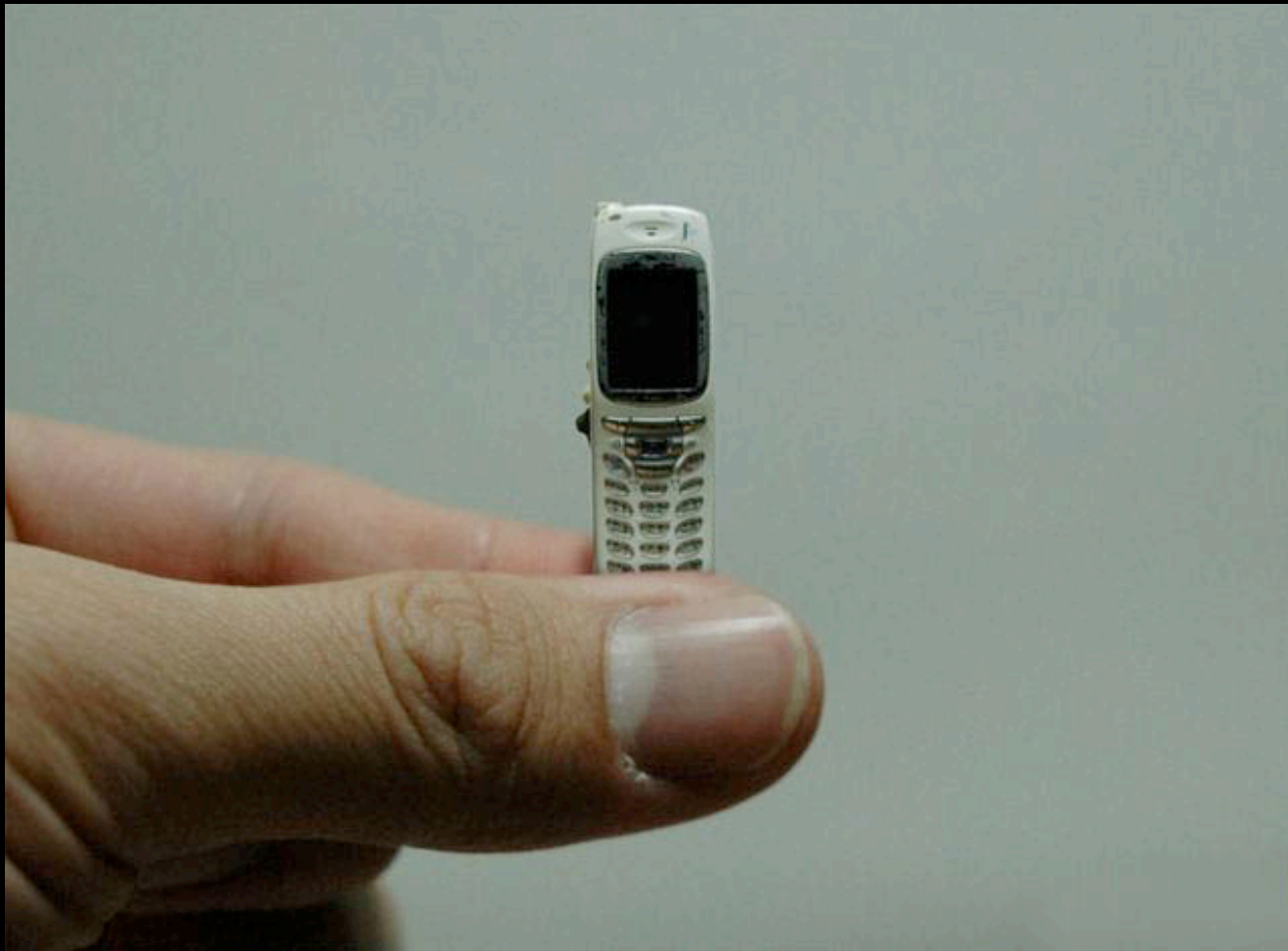
Infrastructures fail... but it's not only technical



The world's rough: infrastructures are not seamless, they can fail: unreliable network, latency, bandwidth, security, unstable topology, or network heterogeneity. So what does that mean for location-aware applications? Positioning accuracy can change, networks are patchy, gps works outdoor, not indoor, the transition gps->wifi is not good, etc. Additionally, cost and ownership are important issues.

Problem 4

Unfriendly or tough user interface



/zoolander phone/

Next problem is that user interfaces are often unfriendly or tough to use. I wanted to show an example but since there are many companies here I don't want to be killed.

Reason 1 = mobile UI are tough in itself

Reason 2 = there aren't any perfect solution so far, especially when it comes to maps. My background is in psychology, a field in which lots of studies have shown people get in troubles when "reading" paper maps... so on a tiny screen it's even worse.

Problem 5

Difficulty in interpreting the information conveyed

Automatic location awareness \neq self-disclose

Different levels of granularity often not supported

Mismatch between people's representations

These are my favorite, the one I focused on in my research: the psychology of users. There is an intrinsic difficulty in interpreting the information conveyed by MLA tools.

- Automatically giving each others' location is different than letting people explicitly disclosing it. The underlying variable = intentionality embedded in the production of a message, an act of communication (if A gives her location to B while visiting Paris, that means that she intentionally assumes that she'd like to meet A)

- Different levels of granularity are often not supported: location or geographical coordinates are not meaningful, place rather than space (naming). For example knowing that I am in this Museum building makes sense for a person who'd like to meet me here but it does not make sense to my friends in Geneva.

- In terms of users' perception: there is often a mismatch between how people perceive their environment. A has her own perception of the area (naming) and B has a different.

Problem 6

Bad integration in people's practices and context



The final problem lays in the bad integration of the system in users' practices and context. For instance, this applications by Honda is a map-based social software that gives location indications, navigation, restaurant rating, place tagging... And don't tell me the person will stop on the highway to rate the restaurant he just left.

- 1) privacy issues
- 2) lack of cluster effect
- 3) seamful infrastructure
- 4) user interface
- 5) user experience
- 6) bad integration in context

So let's have a recap of these 6 problems. Anyway, this does not mean that every system have those troubles, I picked-up the most salient ones.

So? what can we do?

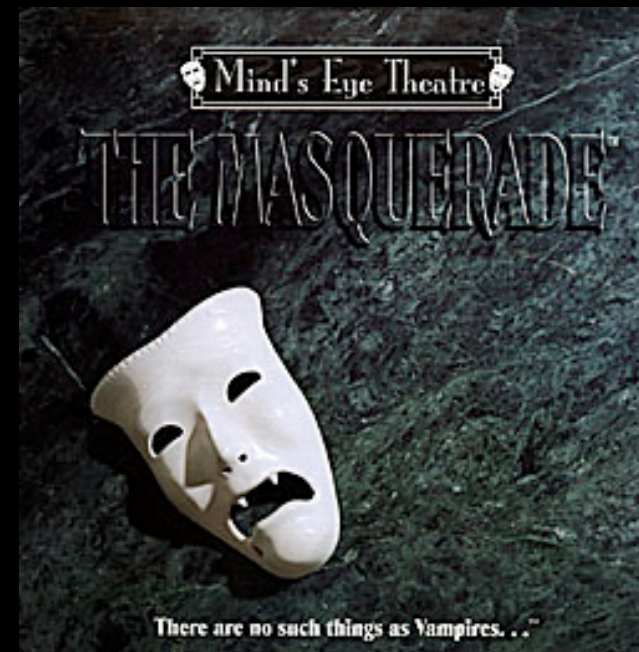
5 key points/relevant directions

This said, let's not dismiss location-aware applications, what would be some relevant directions to explore. The next 5 points highlights some possible avenues.

Assist, not automate



Allow the system to convey intentionality!



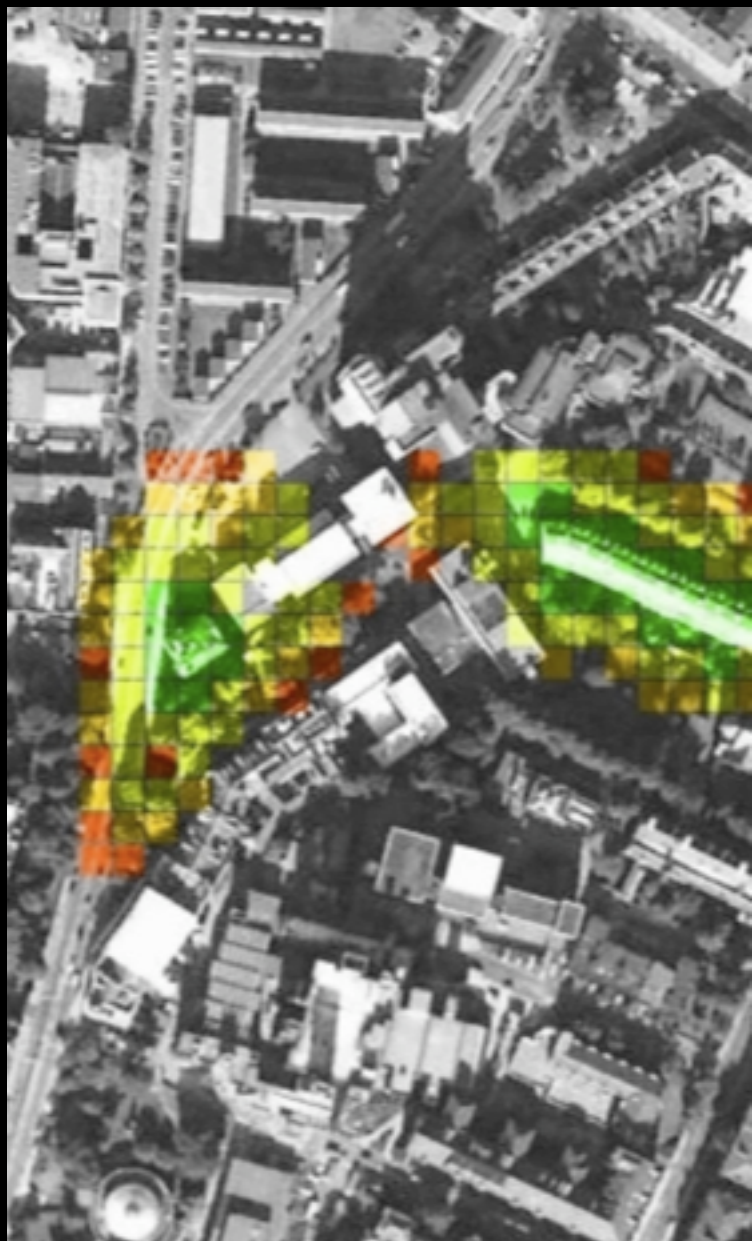
panopticon versus masquerade

First, there is a big difference between completely autonomous systems and assisting human users. The idea is to augment awareness not automate it, the final interpretation should be left to the humans. A good example of such is Jaiku that respect the intentionality of the message that is conveyed: rich presence rather than location. Then of course, the cost for the user is high, but the benefit for the others is high too: they know the intention of the sender!

Also an obvious but important aspect is to facilitate the opt-out and to lie.

In the same line, in terms of privacy what people do not like is the feeling to be seen without the ability to see (Jeremy Bentham's Panopticon) as Michel Foucault argued. BUT people are OK to disclose things when they can control what they see and when they can see others.

Seamful design



reveal the “seams” (limits, boundaries, uncertainties)

when to reveal the imperfections?

...to allow users to lie

Second, seamful design (Matthew Chalmers, University of Glasgow) is another direction. It refers to the idea that ‘seams’ may be inevitable, and users should perceive and appropriate them for their own uses. Present it to users and make them aware of this information so that they can take advantage of it during the game and use it as a valuable resource. For example, it can be a way for people to lie: in a location-based game, giving players a representation of where there is GPS coverage and where there isn’t so that players can go there and use it as a trick. This is what happened in one of Chalmers’ experiment.

Location is more than GIS information



Our patented isolatr technology:

Helping you find where other people aren't.



“Location is more than GIS information” as explained by Kevin Slavin (see his Where2.0 talk in 2006). It’s more than geographical coordinates, it can also be whether a user is indoor/outdoor, whether the mobile device can hear you’re on busy street. It’s about richer information. A good example is Jabberwocky (Intel) that allows to see the presence of familiar strangers in the vicinity, anonymized.

And valuable experiences might be created with disinformation.

Slavin suggests that it might be valuable to get lost or to forget where where they are. An example of such idea is “isolatr”, a system that aims at helping where other people are not.

The raw information (location) is the same but it’s a difference way to query it.



Take advantage of histories

Profile



Jyri Engeström

See you on the other side in Heathrow, London, UK 4 hours, 40 minutes ago

You and Jyri are contacts!
[Remove Jyri as a contact.](#)

Latest from Jyri



[See you on the other side](#) in London, UK

On mobile 4 hours, 40 minutes ago. [Add Comment](#)



[About to begin a longhaul seated next to an extended Far Eastern family with relatively vocal young ones and a grandpa with a dreadful cough. Thankful for remembering to bring earplugs & extra Mac battery in London, UK](#)

On mobile 4 hours, 56 minutes ago. [1 Comment](#)



[Boarding for SFO. ETA around 1pm](#) in London, UK

On mobile 5 hours, 11 minutes ago. [Add Comment](#)



[In transit](#) in London, UK

On mobile 5 hours, 49 minutes ago. [Add Comment](#)



[Boarding for LHR in Helsinki Airport, Helsinki, Finland](#)

On mobile 9 hours, 23 minutes ago. [Add Comment](#)



[Checking in in Helsinki Airport, Helsinki, Finland](#)

On mobile 10 hours, 33 minutes ago. [Add Comment](#)



[Cab to airport](#) in Liisankatu, Helsinki, Finland

On mobile 11 hours ago. [Add Comment](#)



[Waking up in Kruununuhaka, Helsinki, Finland](#)

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In addition, do not forget the asynchronous character of location-awareness. Histories of interactions as in this Jaiku example are interesting. Past interactions have an added value and can be used to create conversations AFTER the events (comments). This “history” is a social object that can be shared and serve a trigger for conversation (see Jyri Engeström’s talks about social objects): it’s flickr with locations instead of pictures. Why this is important? because in a group it gives a peripheral awareness and a way to enhance social bonds.

Beyond human location-awareness



What about making explicit the phenomena that are invisible or implicit (through location-aware technologies)?

Blogging pigeons (Beatriz da Costa)
Blogjects

Maybe we're wrong with thinking about human awareness, let's think beyond humans and think about invisible phenomena and objects.

Beyond human location-awareness

... or to create new connections between the physical environments AND the digital worlds



Flavonoid by Julian Bleecker

A topic I am interested currently in my research: how to enhance gaming experience through connecting the physical environments and digital worlds.
By providing data feeds about the kinesthetic activities of the person wearing Flavonoid, various embodiments representing that data can be created in digital environments

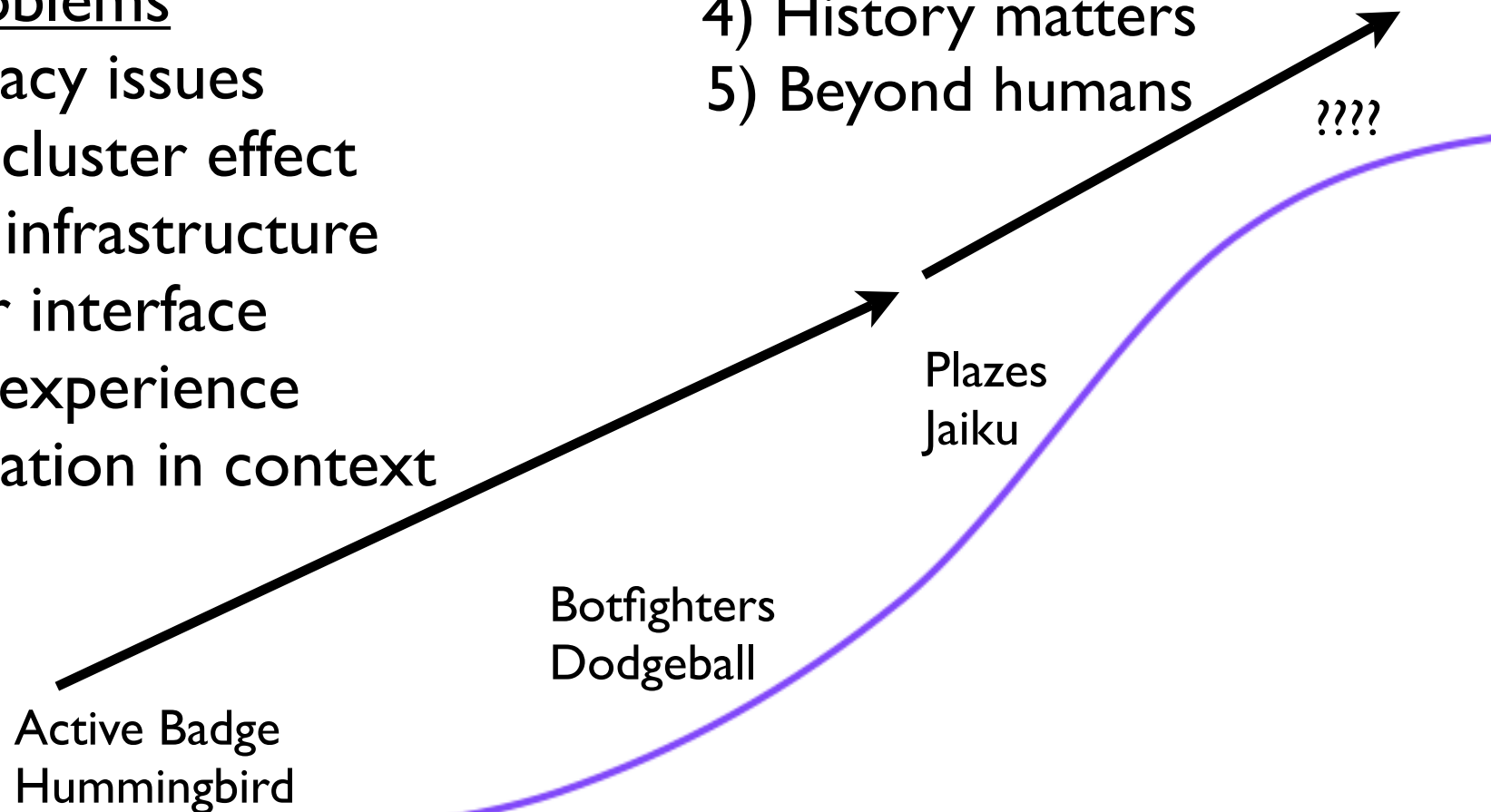
Conclusion

Problems

- 1) privacy issues
- 2) lack of cluster effect
- 3) seamful infrastructure
- 4) user interface
- 5) user experience
- 6) bad integration in context

Opportunities

- 1) Assist, not automate
- 2) Seamful design
- 3) Beyond GIS information
- 4) History matters
- 5) Beyond humans



Conclusion: innovation in location-aware systems is a slow process, no disruptions so far
Then we have to explore various paths

thank you
nicolas.nova@epfl.ch

thanks for pictures:

blast theory

company logos

eatliver

honda

kyri engeström

b. da costa

julian bleecker