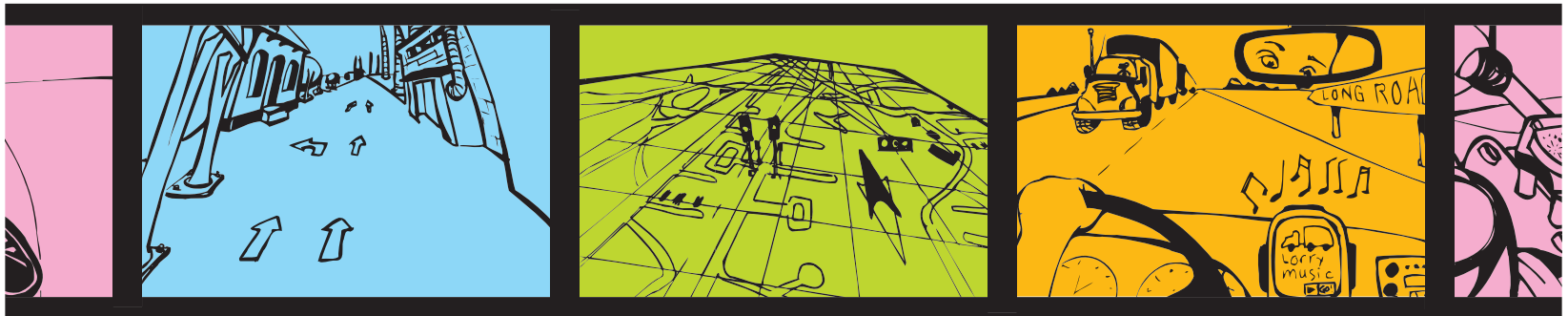


further reading

- Brunnberg L. and Juhlin, O. (2003) Movement and Spatiality in a Gaming Situation – Boosting Mobile Computer Games with the Highway Experience. In Proceedings of Interact 2003, Ninth IFIP/TC13 International Conference on Human-Computer Interaction.
- Esbjörnsson, M., Juhlin, O. and Östergren, M. (2004). Traffic Encounters and Hocman – Associating motorcycle ethnography and design, Forthcoming in Journal of Personal and Ubiquitous Computing, Springer-Verlag.
- Esbjörnsson, M. & Juhlin, O., Combining Mobile Phone Conversations and Driving - Studying a Mundane Activity in its Naturalistic Setting, In Proceedings of ITS World Congress 03, Ertico, Madrid, 2003
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the interactive road enhancing the experience of road use

“The sense of spatial sequence is like that of large-scale architecture; the continuity and insistent temporal flow are akin to music and cinema. The kinaesthetic sensations are like those of the dance or the amusement park, although rarely so violent.”
Kevin Lynch, Donald Appleyard et al., *The View from the Road*, MIT press, Boston, 1964

The Interactive Road is a research agenda being pursued by the Mobility studio at the Interactive Institute in Stockholm since 2001. It explores the benefits of increased interaction between individual drivers, and road users in general, to create innovative services and corresponding technology. It recognises that the highway is used, apart from transportation, as a place of work and mobile experiences.

The design approach relates to the work conducted in the early 1960s, in which the famous architects Kevin Lynch and Donald Appleyard carefully described the special characteristics which make up the

highway experience. They believed that road construction could be further improved if it was informed by detail studies of road user experiences. Today, forty years later, we are fortunate enough to customize the highway experience by means of dynamic and mobile computing.

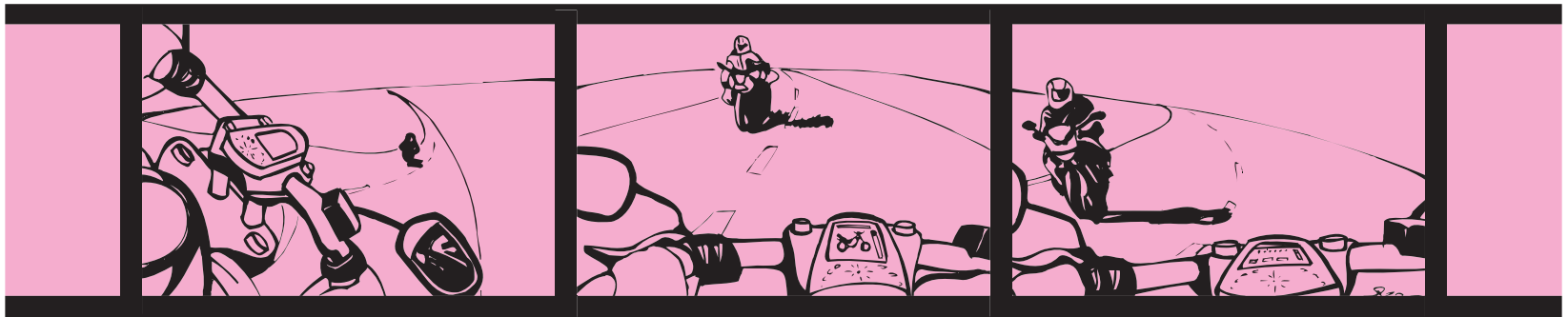
Our approach is an internationally unique research focus of importance to all who live a large part of their lives on the road. The results from the Studio, which include a number of prototype services, are under constant evaluation by the scientific community to ensure their quality and distinctive character.

We also collaborate with industry to bring the ideas to the market.

A number of prototype services are available such as Road Talk for increased road safety, Placememo, for mobile workers, Hocman and Sound Pryer, for enhanced experience of traffic encounters, and Back Seat Games, for enhanced enjoyment for passengers in cars.

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- Esbjörnsson, M., Juhlin, O. and Östergren, M. (2003). Motorbikers Using Hocman – Field Trials on Mobile Interaction. In Proceedings of Mobile HCI' 03, Fifth International Symposium on Human Computer Interaction with Mobile Devices and Services, Springer Verlag.
- Esbjörnsson, M., Juhlin, O., and Östergren, M. (2003). Motorcycling and social interaction – Design for the enjoyment of brief traffic encounters, In proceedings of GROUP'03, International SIGGROUP Conference on Supporting Group Work, ACM Press.
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hocman sparkling interaction on the road

It is Sunday afternoon and the sun is shining. Eric thinks it is a great day for a ride together with some motorcycling friends. He picks up his Hocman-device and browses through the log of bikers he encountered yesterday, while spending a couple of hours on the curvy roads south of Stockholm. He decides to contact 'Minipotatoe' and 'Madhonda' who he has met a number of times before, that is, for a couple of seconds on the highway and a bit longer on the internet. They decide to meet at BulkyBurger on the main street for a ride.

Motorcycling is a strikingly social activity. Bikers like to meet other bikers, and especially along the roads. Naturally, such meetings tend to be rather brief and geographically dispersed.

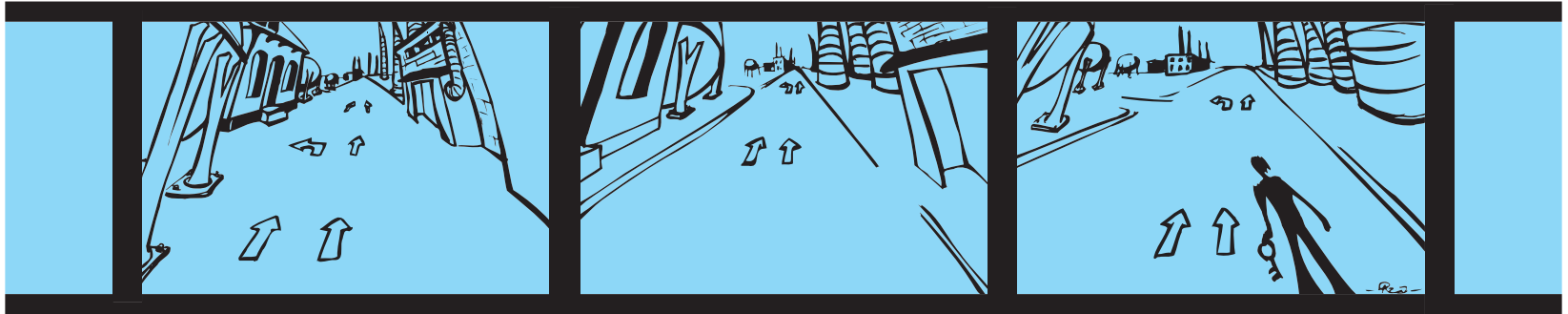
Hocman is a prototype service designed to spark and further social interaction building on these traffic encounters. It is based on handheld computers capable of short-range ad hoc wireless networking. When the bikers head out on the roads the software continuously senses similar devices nearby. If another Hocman is in the vicinity it makes a sound to alert the biker that a meeting is taking place, and there also is

an automatic exchange of web pages between the devices. The sound alert has already proven to be highly appreciated by bikers.

The personal web pages may contain contact information, for-sale ads, pictures, etc. When the biker gets off his bike he can examine the log and read the pages captured. The pages can be helpful when planning future encounters, or when referring to rides in discussions in other prevalent media such as the internet.

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backseat games turning travel into a fantasy adventure

“Are we there yet?” For kids, travelling in a car can be very tedious, but with Backseat Games any trip can become an exciting adventure. The game turns churches, bridges and other roadside objects into a fantasy land filled with virtual creatures, treasures and adventure. By pointing the gaming device towards objects as they pass by, players can defend themselves against attacking creatures, pick up magic artefacts or collaborate with players in meeting traffic.

Two different prototypes have been developed on handheld computers. First we designed a game where we used a digital compass and GPS-receiver to connect the game to the surrounding world, and make it possible for the player to designate real world objects. Then we designed a multiplayer game for traffic encounters based on ad-hoc peer-to-peer networking, which connects players in each other’s vicinity.

Mobile games have the potential to become compelling in a new way, if they include the

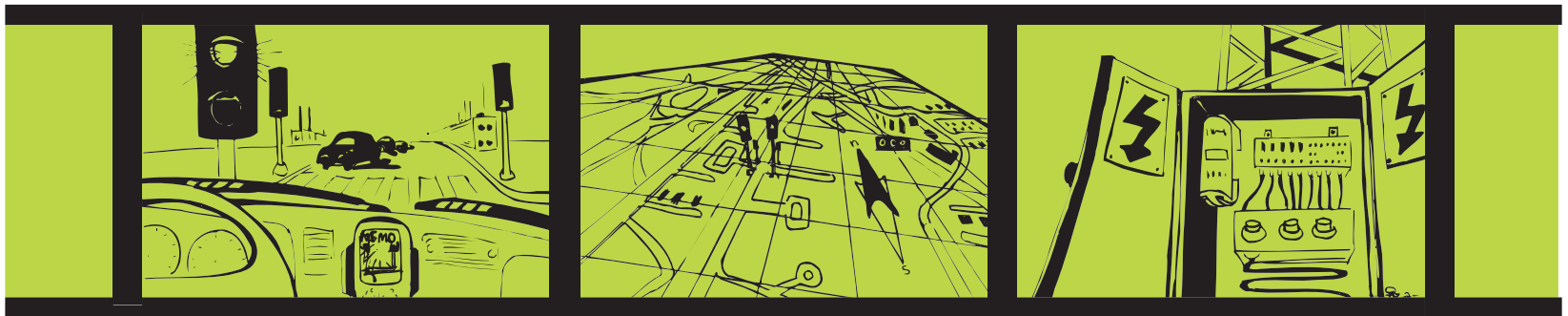
vivid and dynamic mobile context. Travelling by car is a perfect example, where the ever-changing scenes, the speed and the brief encounters help to provide an extraordinary experience. Our research questions concern how mobile games can benefit from travelling, and we want to better understand the possible connections between games and their surroundings. It is important to carefully take into account spatial relations and understand how the game should be designed so that the player understands what to do in this new environment. Children should be able to enjoy exploring and travelling through the magic landscape, as well as encountering challenging game tasks.

The road inspector is out on his daily inspection tour. He spots a damaged road sign, but the traffic situation does not allow him stop immediately. Instead he uses PlaceMemo to save the geographical position and record a voice-memo, so that he won't forget about it like he always used to do. Later the same week, before heading out on the same stretch of road, he listens through the memos. The map gives him a rough idea of where the reported malfunction is situated, and by reviewing the message he knows what equipment to bring. Back on the road he concentrates on identifying new faults. When approaching the location of the broken road sign, he can hear the memo played in its entirety just before he reaches the broken sign. He gently decreases the speed of the truck and comes to a halt without jeopardizing other drivers, and then gets out to mend the sign.

placememo supporting mobile reporting in a vast working area

further reading

Esbjörnsson, M. and Juhlin, O. (2002). PlaceMemo – Supporting Mobile Articulation in a Vast Working Area Through Position Based Information. In Proceedings of ECIS'2002, The 10th European Conference on Information System, University of Gdansk, Poland.



The PlaceMemo prototype is being developed to facilitate infrastructure management tasks, like identifying, reporting and taking care of malfunctions along the roads. The vast working area of road inspectors makes it hard to remember all the identified defects and organise the work to fix them. This system enables the inspectors to associate memos to geographical locations along the roads. Our design supports the simultaneous handling of reporting and receiving reminders while driving. Additionally, the memos could easily be shared among colleagues, for instance to enable job rotation.

We are interested in the development of innovative mobile services, and in acquiring knowledge on how to take advantage of different contextual factors. The design choices were based on the requirements discovered in an ethnographic field study, and the service is based on handheld mobile devices equipped with GPS-receivers. PlaceMemo is interesting from a commercial perspective, since there are many occupational groups working with infrastructure management in vast settings. We have started initial work towards commercialisation of the concept.

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soundpryer joint music listening on the highway

Sandra attaches her PDA, with built-in Wi-Fi card, to the dashboard and starts the Sound Pryer application for an alluring music experience. As she hits the road, Sound Pryer plays her favourite music on the car stereo. After a while she is bored by driving. Suddenly, the icon of a red lorry appears on the screen. She says to herself: "It must be that one over there", as the latest Cardigans song fills her loudspeakers. Sound Pryer returns to playing her own music after she passes the lorry and sees it fall behind in the rear mirror. Sandra thinks "Cool guy, I have to get that music at the next stop."

We present Sound Pryer, which is an implemented peer-to-peer application of mobile wireless ad hoc networking for PDAs. It enables music eavesdropping in traffic encounters, by streaming MP3 files via the Real Time Protocol. The metaphor used to guide the design of Sound Pryer is that of a "collaborative" MP3 player. A user can play his or her own music, but also tune into other players and hear what they are playing as long as he or she is within close proximity. The Sound Pryer application serves pure entertainment purposes: the fun of listening to music, either one's own selection or somebody else's. It draws on the idea that people take an experiential and aesthetic interest in the surrounding traffic, and that they are willing to share music, since people are effectively anonymous to each other in that situation. Still the visual, and now audio, contact provides for a special and titillating shared experience, that of prying into other cars.