

# The Mobility Studio – an Interactive Institute Studio Application

Investigating and inventing the future of computer supported mobile life



Mobility Studio – An Interactive Institute Studio Application

Applicants  
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RoadTalk Group

## Summary

We argue that the research group RoadTalk (from now on, called the Mobility Studio) is an ideal candidate for forming a studio in the Swedish Interactive Institute, to pursue the research theme *Mobility*. We offer the following reasons as our main arguments:

- *A well-functioning research group already in place*

Oskar Juhlin and his PhD students, along with various experts in the areas of technology and mobility form the RoadTalk group.

- *Proven academic track record*

Publications have been made in various international conferences and journals, with submissions already in place to conferences and journals to be published in 2001.

- *Excellent international contacts*

The Mobility Studio has already been very successful in initiating international research contacts with institutions such as MediaTeam, University of Oulu, Finland. Through the *ROADTALK project*, the studio forms the centre of an international network of researchers in transport and sociological designs issues related to mobile transport informatics. The research team consists of researchers from the Gothenburg University and Viktoria's Institute.

- *Strong commercial interest*

The studio has initiated partnership discussions with both local and international partners. These include Sun, Motorola, Microsoft, Digital Bridges Pty Ltd, Svenska Spel, Compaq, IR Vision, Palm, Handspring, Ericsson and Nokia. The studio works with both government and industrial bodies with a goal to see the research result in prototypes useful for industry. Combining the knowledge from the Mobility Studio studies, SME's are able to understand the effect that technology is playing on society.

- *An ideal meeting place*

Mobility Studio is currently based at the premises of the Interactive Institute, where it works side by side with other Interactive Institute studios as well been in contact with the other groups within the Swedish Information Technology Institute (SITI) mobile informatics strategy.

- *Original and important research themes*

The proposed core research theme, *Road Use*, is important for both academic and commercial reasons. We believe that a studio based around the theme of mobility, it's use and affect in these environmental settings, would be well suited to complement the other studios in the Interactive Institute. In particular, by having research results on the effect of technology and mobility on all forms of society, other studios are in a better position to pursue their own research projects. Other themes that will be investigated as well include *Collaborative and Location Based Mobile Gaming*.

## Studio Description

The objective of the Mobility studio is to explore innovative and commercially interesting IT solutions for mobile people. The studio will produce results according to the guidelines of the Swedish Information Technology Institute:

- Industrial participation: In all projects, at least 50% of the resources will be provided by industrial partners.
- Applied results: The primary applied result of the projects will be “evaluated mobile solutions”.
- High quality research. It will be important to produce scientific results that meet the quality standards of the most prestigious academic journals and conferences.

The Mobility studio at the Interactive Institute investigates and invents the future of computer supported mobile life. As computers and networks become increasingly wireless they will become increasingly useful for mobile people engaged in co-operative activities. We believe that it is favourable to take advantage of mobile user practices and new technologies such as the Mobile Internet by pursuing associative research pushing competencies on social practices, technologies, science, and business close together.

The Mobility studio will pursue research in three different user contexts. We will initially focus on the road use research programme, which considers the demands of car drivers, pedestrians etc. This field has its roots in research earlier pursued at the Viktoria Institute and Göteborg University. It is a promising field both scientifically and technically. Secondly, the studio will focus on mobile games and interested personnel have already been recruited. Finally, the studio will identify a third important research area during the year 2001.

*The overwhelming research question for the studio*

”To investigate and invent the future of computer supported mobile life.”

## Studio Vision

It is a general problem in the design of information technology to find representative ways to describe what users actually do when they do work. Detailed field investigations of everyday practices have been useful, especially in the field of Computer Supported Co-operative Work (CSCW) where design of technologies to support interaction between people is of importance. This form of fieldwork, where researchers observe users' daily activities, has proven useful in obtaining a better understanding of the context wherein the new technology can be utilised, knowledge of great importance for designing new systems. However, critics have claimed that this kind of research is too detached from commercial issues such as *originality*, *time to market*, and *cost* in order to build real products. Therefore there is a need to integrate ethnographic skills with commercial interests, which is achieved in a two-step design process. The development work is conducted according to an iterative two-step process between design and evaluation. The design stage is based on empirical user studies. Primarily, the ethnographic method is employed.

The analysis of the field material is presented in design sessions, where this experience of daily work is combined with familiarity with new technical possibilities. The purpose is to create an innovative atmosphere where ideas for future applications can arise. Design sessions, which are interdisciplinary workshops, combine the participants' competencies, ranging from social science to computing science. The objectives are to construct technology that concurs with how "users" conduct their work. A result of this organisation for development is that it contributes both to academia and to participating industry. Papers are written and prototypes are developed.

## **The Road Talk Research Program**

[www.roadtalk.org](http://www.roadtalk.org)

Car drivers have become used to being cut off from many different social activities when being on the road. It is difficult to collaborate with people in the surrounding due to the enclosed position and the speed of the vehicle. They are also cut off from important activities going on at distant places such as the home or their work. An option is to turn on the car stereo, lean back and contemplate. However, in a near future the driver can choose from a broader range of alternatives and possibly become more engaged in collaborative activities. Then, our understanding of road use could be drastically altered and current practices regarded as dull, uninteresting and unproductive. Already, new alternatives opens as the road users often can make or receive phone calls on their cell-phones. The increase in opportunities are due on the one hand to the fast development of mobile information technology, and on the other the road users' demands and needs.

Mobile equipment (like cell-phones or Personal Digital Assistants PDAs) are carried around and used in many different circumstances. Therefore, it is only natural that they become used in a road context. It is for example possible to pursue some parts of the office work, such as making phone calls, on the way to the office. The office is paradoxically accessed already when the door to the car is opened in the morning. Further, it seems likely that the next generation of mobile information technology (new generation of mobile digital networks such as GPRS and UTMS/WCDMA) will be useful for drivers and other road users.

## **The Mobile Experience Research Programme**

Gaming activities have been a part of human lives for a long time, but what will happen when we're able to participate in games and other social activities, using different mobile devices? In a wide perspective you will be able to "turn your life into a game" as long as you're online. Soon, different types of wireless techniques (such as ad-hoc networks, UMTS, Position based services etc.) will make it possible to play games in a new context. It will be possible to "charge" the reality with communicative aspects that characterises the virtual world. The real world and the virtual world are beginning to converge. This process will affect the way people create meaning, how the experience relations and how they interact with one another. Take for instance; the every day situations in a modern city were you constantly meet new people. No one reflects on it, situations just pass. People coming and going is the natural pace of the urban city. This tends us to continually wait for new opportunities. The question is, can this behaviour in some way be change, using new game concepts and new technology. The mobile experience research program will, as a start, focus on how new technology can change our experience and understanding of social phenomena in the urban city. Were also interested how we can extend virtual game experience (for instance MUD: s) into the real world using mobile technology Since we already

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has experience within the studio, regarding cars and mobile technology, it will be natural to look further into how games can be adopted into this context.

## Projects

**Guarding the Roads:** We are investigating the practices of road guards. This is a truly mobile work, which includes the identification, reporting and repair of defects on the road infrastructure. We will develop tools that are adapted to their movements along the roads, and support situated collaboration.

**Office-drivers:** Drivers who reach the Office or the Home in Advance of Their Car: How do people use mobile technologies in their cars and for what purpose? This project will initially investigate in to these practices and then develop support for office-work in cars.

**Interactive Road:** Roadside users try to find different ways to communicate with passing road users. This project will study current so called “illegal signs”, and then develop new ways of achieving better contacts between moving and stationary road users.

**Bike talk:** Communication among bikers: Motorbike users have always praised the convivial aspects of driving. But how do they organise their social driving and how do we develop it to become even more social?

**Bus Talk:** A current trend in public transport is to develop mobile data management system. But this new system has not become as successful as expected. In this project we suggest that these system does not support local articulation of the data. An advanced speech communication could be a useful tool in combination with mobile data.

**Talk Snow:** New technologies, to support awareness and local collaboration, are tested in air transport management. This project evaluates the Snow Card system at Arlanda Airport to organise snow cleaning of the runways.

**Collaborative Gaming:** How do we achieve the goal of mobile players collaborating with each other to solve problems in gameplay. This project will develop new ways of achieving better mechanisms of collaboration between mobile users with mobile devices.

**Location Based Gaming:** The environment and location that surrounds a mobile gamer can significantly add to the gameplay involved. This project will examine ways of achieving various aspects of location based gaming, and examine what parameters are important in increasing the pleasure and gameplay associated with mobile players.

## References

The Swedish Information Technology Institute (SITI) is currently running a research programme on mobile informatics ([www.siti.se](http://www.siti.se)). The research is carried out at the mobile informatics group at the Viktoria institute, and the social computing group at SICS in Stockholm. This research programme has formulated a strong support for research in this area.

Research in this area takes place in a number of academic fields. The main fields are Computer Supported Co-operative Work, CSCW, HCI (Human Computer Interaction) and ITS (Intelligent Transportation Systems). The main conferences are ACM's biannual "CSCW conference" as well as the biannual European CSCW-conference. Further, ACM's annual SIGCHI conference and finally the annual ITS world congress. There exists a number of conferences and journals that are of interest to the studio on a more technical side. These include ACM's SIGGRAPH (Graphics and Interaction), IJCAI (International Joint Conference on Artificial Intelligence), SIGCOMM (Communication), SIGMOBILE (Mobility).

## **Co-operation partners**

The most important partner will be the Swedish Information Technology Institute (SITI). They have already decided to provide 3 million sek to the road talk group at the Interactive Institute for 2001 ( see appendix 1 for the research application). SITI is pursuing a national programme on mobile informatics. Their interest in II is partly due to an intention to strengthen on the one hand the application oriented research nationally, and more specifically the research in mobile informatics in the Stockholm area. However, during the year the research will be reorganised. When the SITI program ends, the Swedish Foundation for Strategic Research will launch a new program in the same area. The SITI-researcher will therefore during the year formulate a new research proposal in order to make the transition as smooth as possible.

Potential partners, where promising contacts have been made:

Digital bridges, U.K., Svenska Spel, Bergendahls stiftelse/Cleanosol, Widcomm, Lucent, Motorola, Nokia, Ericsson, Sun, Compaq, Hogia Innovation, Swedish National Road Administration, Moby, Kabel New Media, Spray, MadSci, Sun, Elevance, National Land Survey, Lanstyrelsen, Gavleborg, Motorola, Microsoft.

We will collaborate with two other research groups doing user oriented design of mobile information technology in the same research programme of SITI. They are the Mobile Informatics group at the Viktoria institute and the Social Computing group at the Swedish Institute of Computer Science (SICS). We will also collaborate initially with the MediaTeam, at the University of Oulu, Finland, through student and staff exchanges.

We will work together with students at the IT-university in Kista. The students can at present choose the "Space Talk"-project, when pursuing a project course this spring. The project is designed by the Road Talk group. We are also in discussion with the Transport and Communications program at Campus Norrköping/Linköping University.

The Bike Talk project is partly funded by KFB as part of the *E-people meets Mundane Informatics*-program. E-people is a joint researchprogram between the road talk group and the Play group at Interactive Institute as well as Mobile Informatics and Knowledge Management at the Viktoria institute. The program will run three year and include a number of joint workshops.

We will work closely with a Ph D student at the section of science and technology studies at Göteborg University. He will continue research that previously was conducted by Oskar Juhlin, and also contribute directly to the Road Talk research at the Interactive Institute.

## **Novelty value**

With the increase in technology occurring, a study of how this influences a vast population is required. Sweden has an opportunity to study the effect of this technology first hand, as the nation rolls out broadband and wireless services.

The program rests upon the assumptions that:

- Many people in the future will be highly mobile.
- Mobile people will have ubiquitous and instant network access.
- They will use many different kinds of mobile IT solutions.

Accordingly, the market for mobile IT solutions will become very big in the future. The need in industry to conduct applied research on new solutions for mobile IT is huge, due to the following reasons:

- Most companies in the mobile IT business have an historical focus on infrastructure. We assert they will have problems to change to service and application oriented business model. Clearly, they need new R&D initiatives focusing on application and service.
- Scandinavia is “one step ahead” the rest of the world in Mobile information technology. We should take advantage of the lead. This requires new efforts and cooperation.

## **Information questions**

The Mobility Studios research and work shall be bound in it's own publications, and also through traditional conference and journal that are internationally reviewed. The studio will be active in publishing its results, and shall search for specific target groups, which will benefit from the studios research.

The results are of interest to policymakers, companies, academics, local communities and planning organisations. The effect of technology in communication across the age groups and into the home and workplace are of great importance.

The studio will work in an area where the interest from a wider audience is great. This for example is already visible in the road talk programme. The studio's activities will be known through presentation of scientific papers at conferences as well as demonstrations in different settings. The studio's activities are related for example to important discussions on future road use, which is central in the public debate.

## **Evaluation**

The Mobility Studios research and results is under much scrutiny from other partners in the Interactive Insitute and SITI reviews. Industry partners and local community partners will examine the results and suggest further changes to the research.

The studio will engage in scientific communities such as Intelligent Transportation Systems and Computer Supported Co-operative work. Thus, the scientific quality of our work will be continuously evaluated. But it is also important to evaluate the studio in relation to our other goals and to the general goals of the Interactive Institute. The studio will therefore be continuously evaluated internally. The strong collaboration with SITI's mobile informatics research programme is another guarantee for good evaluation. This research programme demands strong collaboration with other partners which is a driving force for a continuous evaluation of the studio's activities as seen from our partners.

## Staff

The staffs involved in the Mobility Studio have been mentioned in the budget. Primarily they include a director to handle the day to day running of the Studio. The chief researcher is Dr. Oskar Juhlin who has a number of doctoral students working on the research themes of the studio.

## Premises & Equipment

The studio will be located at the Interactive Institute, Stockholm. We will conduct scientific work, which includes writing and reading. Therefore, the researchers need to work more privately on occasion. However, project work including several of the people in the studio is best pursued in an open environment. Thus, the office should consist of both open and closed spaces. The studio will engage in design for road use and will need a car to test and demonstrate the use of our prototypes. We are therefore in the need of a parking lot. The studio will also explore the use of mobile information technology. Therefore, it is necessary to use these kind of devices to better understand the potential of these tools. The studio will need a number of different handheld devices and a wireless LAN in our premises. There will also be the likely situation of placing sensors and base stations throughout the building and surrounding regions for experimental work. Several mobile devices will be used as concept enhancers to give the researchers and partners physical objects to use as artefacts for discussion.

## Budget

### Costs

#### Lab

Computers, PDA's, conference utilities  
licenses, telephone, travel etc.

1,700.000 sek

#### Local Rent

240.000 sek

#### Salaries

Director

600.000 sek

Researchers (2 part time, 6 fulltime)

2.400.000 sek

#### Total

4.940.000 sek

## Financing Model

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The studio is primarily financed in the first hand by SITI, to a value of least 3 million sek a year. This financing needs to be matched by commercial partners, either financially or by in-kind work. The minimum end year result will be at least 6 million sek in commitment from SITI and other commercial partners.

### **Obstacles and problems**

It is important to achieve academic success as well as attract industrial interest to obtain funding from SITI. A central issue in the growth of the mobile group is to find staff with an interest in mobile technologies, who at the same time share our interest in research and exploration of new applications.