

# “I’m waiting where we met last time”: Exploring everyday positioning practices to inform design

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## ABSTRACT

In light of recent attempts to design location-based mobile services, we present findings from a study of the ways in which positioning is done in everyday talk over the mobile phone. We show that a location is more than a coordinate on a map, and give examples of how people formulate location in a number of different ways according to the particulars of the activity. Based on these findings, we argue that rather than delivering location information in the form of geographical coordinates, location-based services should describe location in ways relevant to the users, thereby supporting the existing positioning practice.

## Author Keywords

Location-based services, position-based services, mobile phones, conversation analysis, mobility.

## ACM Classification Keywords

**H.5.3.B** Collaborative computing, **H.5.3.C** Computer-supported cooperative work

## INTRODUCTION

In recent years, the research community as well as the wireless device manufacturers, service providers and telecom operators have put a lot of effort into designing what is often called location-based services, i.e. services relying on or adapting to their location. There is a very high expectation on these services; optimistic forecasts suggest that sales numbers for location-based services could grow from just over \$2 billion by the end of 2002 to more than \$18.5 billion by the end of 2006<sup>1</sup>.

This paper deals with the type of location-based services sometimes called location-tracking services (Barkhuus and Dey, 2003, Kaasinen, 2003). Location-tracking services

allow people to locate others. Roughly, the location-tracking services on the market today provide one or more of the following features: (i) The *location* of others, (ii) the *distance* to others, (iii) the *direction* of others, (iv) the possibility to *name a location*. These services are all based on a map metaphor, presenting geographical location in the form of a street address, a dot on the map, or coordinates. So far, these services have not had as much success as expected.

In this paper, we turn the problem upside down. We look at the current everyday practice of locating others and describing locations, what we call positioning. This form of positioning is already a massively prevalent activity, and it is carried out using everyday language. The mobile phone allows this positioning work to be carried out while on the go. The mobile phone is often used for the renegotiation of time and place for meetings (Ling and Yttri, 2002). It is a commonly noted observation that many mobile phone calls overheard in public deal with the positioning of others.

So, there is already an existing positioning practice. We argue that new technologies relying on location will need to fit into this existing practice, rather than creating their own set of practices. Therefore, in order to understand how location should feature in mobile services and applications in a manner relevant to the people using these systems, we believe a useful method is to investigate the ways in which location features in everyday talk.

In order to explore the everyday positioning practice, we draw upon the work of Conversation Analysis (CA). Previous CA investigations of the ways in which place<sup>2</sup> is formulated in everyday interaction, has shown that there are a number of ways to describe a place which are ‘correct’ in the sense that they give access to the place, but this does not necessarily mean that that term is the right or relevant to use, in that particular course of interaction, with those particular participants (Schegloff, 1971). In that sense, the ways in which location is expressed varies according to the particulars of the activity.

<sup>1</sup> www.analysis.com

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<sup>2</sup> We want to be cautious here not to treat the term ‘place’ as it has been theorized in HCI, CSCW and elsewhere. By place, we refer to the everyday use of the word, that sense of being somewhere and doing something or other.

So far, there are few studies of how location is formulated in mobile phone conversations. As part of an ongoing project on mobile phone talk, we have gathered a corpus of mobile phone conversations. In an initial study using conversation analysis, we have explored the ways in which mobile phone users talk about their activities, locations, and availability for having a conversation (Weilenmann, 2003). In order to facilitate the collection of these conversations, we developed a software solution enabling automatic recordings of mobile phone calls (Axelsson and Leuchovius, 2003).

Based on our analysis of mobile phone conversations, this paper provides a discussion on how technology could support the existing positioning practice, by shifting from delivering location information in the form of coordinates and geographical data, towards describing location in ways relevant to the people using the services.

The paper is outlined as follows; we start by giving a background consisting of a brief overview of relevant location-based services, as well as conversation analysis and other related research. We then move on to describe how the empirical data was collected. In the findings section we present excerpts from mobile phone conversations and our analysis. Finally, we conclude the paper by discussing the findings, and what they imply for the design of mobile location-based services.

#### **LOCATION-BASED SERVICES**

In this paper, we focus on the type of location-based services sometimes called location-tracking services. Location-tracking services allow people to locate others. Another form of location-based service is so-called location- or position-aware services, where the device is “aware” of its location, and adapts the service accordingly. Example of the former is different kinds of friend-finding features, and examples of the latter are services which provide local information e.g. events, shops, traffic information and weather forecasts (Barkhuus and Dey, 2003, Kaasinen, 2003).

Roughly, the location-tracking services on the market today can be said to provide one or more of the following features: (i) The *location* of friends or others – presented as a street address or geographical area, (ii) the *distance* to others. (iii) the *direction* of the located person, (iv) the possibility to *name a location*.

The first mobile location-based services for consumers in Sweden became available a few years ago. One of the very first was Friendfinder from Telia, a service which enables friends to locate each other using their mobile phones. In order to be able to locate one another, the users have to ask each other for permission, and when accepted the users can locate each other. The service is based upon GSM positioning, and the user interacts with the system using text messages or WAP. The position of a located user is returned as a street address or geographical area. The

*distance* to the other party is also supplied, as well as the *direction*. No notification is sent to the located user that he or she has been positioned. Similar friend-finding services are available in other countries as well.

Telia also provides a multiplayer location-based game called Botfighters. The game is played using text messages, and is designed to encourage interaction between users within the game. When one user tries to engage another in a fight, a message is delivered to the attacked user indicating where the attacker may be. The game shows the same type of location information as in Friendfinder, namely position presented as an address or area, and *distance* in meters.

Another location-based service, from Cellspotting.com, allows the users to *name cells* in various mobile networks around the world. A cell can be from a few hundred meters in urban areas, to several kilometers in rural areas. Cellspotting is a separate program that users download and install on their phones. When this is done they can receive and send information about the cell they are currently in. If the users are in a cell that has not yet been named, they are given the opportunity to name that cell. So far, the cellspotting database contains information about cells mostly in urban areas in the western world, but the idea is that the database will grow as users gain interest in the service. The names in the database vary from plain addresses or other generic names, e.g. “Park Avenue”, to more specific names based on what is available at the location, e.g. “McDonald’s Nordstan”.

One of the latest commercial location-based services is 3Guru, available with 3G subscriptions from 3. Unlike earlier services, 3Guru utilizes the high speed 3G network as well as GPS and network-based positioning. The service provides the ability to show the location of the user on a map with an accuracy of a few meters. It also allows the user to locate friends and addresses in a similar fashion. Like Friendfinder, the “dot on a map” approach shows the user’s position, and no information is sent to the located user that a search has been done. 3Guru also allows users to *name specific locations*, and save them for later use. This is done at the location by tagging the current location but unlike Cellspotting this information is available only locally to the user. The named places can later be used to create routes for driving a car between those locations.

#### **CONVERSATION ANALYSIS**

*You can read the world out of a telephone conversation* Harvey Sacks, Lectures on Conversation (1992).

To inform design of technology based on the investigation of existing practices is a long-standing method in several fields. Our approach uses a conversation analytic approach. In this section we briefly introduce Conversation Analysis (CA), in order to show how we believe that CA combined, when possible, with ethnographic data is a useful method to approach mobile phone talk.

From the very beginning, CA has been closely linked to the analysis of telephone conversations. One practical reason why telephone conversations were the focus was that telephone calls were particularly suitable for CA methods. By making audio recordings of both ends of phone conversations the researcher would get access to much of the same interactional resources as the participants, since they also are only connected through audio. Most important to this is that, on the phone, participants have no visual access to each other.

By examining in detail transcripts of naturally occurring talk, Sacks and his colleagues began to build a body of observations on conversations. CA is based on the assumption that ordinary talk is sequentially organized and ordered. This order is investigated in everyday naturally occurring conversation. The aim is to describe the methods used by the participants themselves to make sense of the talk. Sacks was concerned with how it is that a speaker comes to use precisely these words, in this way, on this occasion. At the time of Sacks work, talk was primarily considered at the syntactic and semantic level, where the analytic items were isolated, often invented, utterances or sentences. In conversation analysis, one of the basic ideas is that the *sequence*, in which a certain piece of talk occurs, is of utmost importance to its understanding. The sequential organization of talk is crucial to understand how each utterance leads up to the next. As well as being a new way of viewing language, CA also brought about a new sociology, in line with the ethnomethodological approach being developed at this time. Sacks argued that “sociology can be a natural observational science” (1985:21).

Conversation analysis is concerned with the *details* of naturally occurring talk. This is explained by Atkinson and Heritage (1985) as a result of being concerned with members’ methods:

*[T]he sustained focus on the details of interaction is sensitive to the fact that participants themselves observe and analyze each other’s action in extraordinarily detailed and systematic ways. Minimally, then, any empirically adequate approach to research into social interaction must presumably seek to come to terms with the phenomena in a no less detailed fashion than is routinely done by participants themselves.* (1985:412).

## RELATED WORK

In order to understand the work that goes into positioning, we draw from a number of findings within the emerging body of studies of mobile phone use, as well as findings from conversation analytic work on human conversation. This work is introduced in the following sections.

### Location and activity in telephone calls

Schegloff (1979) identifies a number of ways in which the second turns in the phone call (the caller’s first turn) are constructed. Of specific relevance for the present study is the case where the second turn is formulated as a “question

or noticing concerning answerer’s state”. For instance, this can take the following form (ibid.):

A: Hello  
C: Hi can you talk

Or

A: Hello  
C: Hello. You’re home

This deals with issues of availability for having a conversation, as well as recognizing where the answerer is located. Of course, in the second case above, the fact that the caller knows that she or he is calling a residence home, a landline phone, is obvious. If someone answers this call at all, the caller can be certain that the called is home, where the phone is located<sup>3</sup>. This is obviously different in the case with mobile phone calls.

Taking a yet larger perspective on the telephone conversation, another study by Button (1991) deals with how a conversation is organized as part of a series of conversations. He found that arrangements may be oriented to as a “special status topic”, which is specifically used to place the conversation on a closing track” (1991:251). One way of doing this is through “projecting future activities”, for instance, talking about whom should call a third person to make arrangements, etc.

### Positioning in human conversation

Previous investigations of the ways in which place is formulated in everyday interaction, have shown that there is a number of ways to describe a place which are ‘correct’ in the sense that they give access to the place, but this does not necessarily mean that that term is the *right* to use, in that particular course of interaction, with those particular participants (Schegloff, 1971). So for instance, if two people talk over the phone and they both know they are located in the same city, it is unlikely that they mention the name of the city when they make arrangements to meet. In that sense, the ways in which location is expressed vary according to the particulars of the activity.

Schegloff (1971) has studied how people formulate place in ordinary conversations. He wanted to know why a certain place term is selected, rather than another. He argues that “the selection of a location formulation requires of a speaker (and will exhibit for a hearer) an analysis of his own location and the location of his co-conversationalist(s), and of the object whose location is being formulated (if that object is not one of the co-conversationalists).” (Schegloff, 1971:100). So one of the things speakers have to attend to in a conversation is ‘where-we-know-we-are’.

The interactional work needed in order to establish an understanding of place in a conversation can be assumed to differ in talk where the participants are co-located (in face-

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<sup>3</sup> We are not considering here the fact that calls can be redirected to other phones.

to-face interaction) or using stationary landline telephones, as opposed to when participants are dislocated and communicating through a mobile device.

### **Coordination using mobile phones**

Coordination with the aid of mobile phones is a new opportunity for people, something which was not possible only a couple of decades ago. With the advent of the mobile phone it has become possible to communicate with people without knowing where they are, without having to make the call to a particular place. The mobile phone allows for new forms of coordination of everyday life and work.

Ling & Yttri (2002) define *micro-coordination*, which they describe as having four dimensions. The first is the possibility to perform the arrangement and rearrangement of basic logistical details. The second, what they term softening of time, is the effect that the mobile phone has had on the arrangement of meeting times. It is now possible to call and let people know that one is late. Ling & Yttri argue that this possibility leads to viewing meeting times as less absolute than before. The third type of micro-coordination is the possibility to progressively renegotiate the details of a meeting, when problems occur along the route. The technology enables people to rather than initially deciding on a particular place for the meeting, and make another call later to discuss the details. The fourth form of micro-coordination happens when two people cannot find each other at a set meeting place, and make a call to see where precisely at this place the other party is located.

Similarly, in a diary study of 'rendezvousing', defined as the "informal, geographical co-ordination of small groups of friends, family and team mates", Colbert (2001) shows that when problems arise and people fail to meet as planned, these problems are more frequently attributed to modes of travel, over-running of previous activities and lack of information about other rendezvousers, than to lack of information about travel, or local geography. Based on these findings Colbert argues that location-aware navigation services should be less useful than friend finding services.

### **Mobile phone talk and location**

In one of the first available studies of mobile phone use based on recordings, Laurier (2001) investigates the ways in which mobile office workers talk about location when traveling by car. He seeks to explore "why people say where they are during mobile phone calls". Laurier's argument is that this is a question of location used to establish a mutual context in communication, between participants who are dislocated. The formulation of location in mobile phone conversation is tied to the business that needs to be done between the two people, and the place descriptions are thus doing a lot more than just formulating geographical coordinates.

In another study of mobile phone talk (Weilenmann, 2003), we have shown that the question "Where are you?" was not as frequent as one might expect in the openings of mobile

phone conversations. Rather, the frequent question "What are you doing?" sometimes worked as getting a location as part of the answer. This suggests that location, activity and availability are strongly related. The participants thus got information about location, when this was considered relevant, through asking about activity. Location seemed especially relevant if it could give information about a future meeting.

That location can serve several different purposes is also pointed out by Arminen (2003). He argues that location is relevant for parties in mobile phone calls during five different types of activities. Location, according to Arminen, can be "an index of interactional availability, precursor for mutual activity, part of the ongoing activity, or it may bear emergent relevance for activity or be presented as a social fact." (Arminen, 2003). He concludes that while the location of the participants is commonly mentioned, it is not discussed in geographical terms. Rather, location is made relevant as part of the joint activities in which the parties are involved.

### **DATA COLLECTION**

The empirical data presented in this paper derive from a number of studies all forming part of an ongoing project on mobile phone talk. Using conversation analytic methods, we analyze recordings of actual/naturalistic mobile phone conversations, some combined with ethnographic data. In this section, we present how the data collection was carried out for the respective studies.

In the first study (Weilenmann, 2003) the conversations of a teenage girl were recorded using a special recording device, which was specifically built in order to record mobile phone talk. One person was recruited to have her calls recorded, an 18-year-old girl here called Nicky, living in a suburb to Göteborg. During the time of the study, she was attending her last year in a local high school.

In the second study two young men, aged 20 and 22, were recorded over a period of four weeks. The younger of them was still attending high school and had a large social network from school. As he worked as a junior sports trainer in his spare time there were a lot of calls related to this work as well. The other informant worked as a construction worker. The informants were acquainted to each other and lived in the same neighborhood in a suburb to Göteborg. For this study the Autorecorder system was developed and used, a system which enables the automatic recording of all in- and outgoing mobile phone conversations. The recorded calls are saved as sound files directly in the internal memory of the handset with no interruption to the user. The participants could therefore listen to the recorded calls, and, if they wanted, delete certain calls before turning them over to the researchers (Axelsson and Leuchovius, 2003).

In the third study presented here, ethnographic data was collected alongside the recordings. Four people were

followed during two weeks time, and their conversations were recorded using the Autorecorder. Ethnographic fieldnotes were taken and SMS-messages were saved. The people participating in this study were four men, 24-28 years old, undertaking studies at the University. They all lived in Göteborg; three of them studied at the University of Göteborg, and one of them commuted to the University of Uddevalla, located in a small city approximately an hour from Göteborg by train. The students were also followed by one researcher each, during some time of the two weeks.

In all these studies, it has been made sure that the informants could control what was recorded. The informants were able to decide which phone conversations to give to the researchers. After having recorded a conversation, they could easily delete it if they did not feel that they wanted it to be used for the study. The informants were told to let friends know that they would be part of this study, so that those who did not want to be recorded could say so. All names of persons appearing in the conversations have been changed.

In total we have data from seven people, and have recorded over 300 mobile phone conversations. For this paper we have selected a number of sequences from the transcribed recordings, some entire conversations, and some short fragments from longer conversations.

The transcription notations used in the next section are explained in Appendix A.

### FINDINGS: EVERYDAY POSITIONING

This paper builds on the argument that there is already an existing positioning possibility that most people have access to: talk. The mobile phone enables this positioning to be carried out while on the go. The findings suggest that a location is more than a coordinate on a map, and the way it is formulated depends on the particulars of the current activity. The findings can be subdivided into three groups, which all relate to the mutual understanding of places:

- When talking about familiar places people use such terms as e.g. “at home”, “in school” or “the pit”. Although, these terms can potentially have several meanings, it is seldom problematic in the conversation that this term could refer to several geographic coordinates.
- When possible, a formulation of location is based on previous background between callers. A common way to talk about location is to use what we call ‘where-we-met-last-time-formulations’.
- When coordinating a meeting, location is oriented to in terms of what it means to move between locations. A formulation of location is selected which is enough to let the other person understand approximately when the other person will arrive.

In this section we present and analyze excerpts from mobile phone calls in order to show how positioning is done in everyday talk.

### I’m at home

We begin with an observation which might seem quite simple and straightforward, but has implications for the design of location-based services: people do not use addresses or coordinates to describe places with which they are familiar. People use their own common terminology to talk about such places as “at home”, “in school” or “the pit”.

In the first excerpt from our corpus, we will see how two people are at the same meeting place, and make a call to see precisely where the other is located. This type of micro-coordination has been described by Ling and Yttri (2002). In this conversation, it is the party who has apparently already arrived who calls the others to see whether they have arrived or not.

#### Excerpt 1 (Frippe 2003-12-3 12.44.11)

```
((laughter and voices in the background))
Early friend: (Hello)
Frippe: Hello you
Early friend: Hi
Frippe: Eh: where are you ((plural you))
Early friend: We just got in <where are you>
((singular you))
➔ Frippe: Yeah how nice I’m down in the pit
Early friend: Yeah okay <good bye>
Frippe: Bye:
```

The urgency of the reason for the call is seen in that the caller, Frippe, asks “Where are you”, directly after the greeting sequence. This strategy to introduce the topic immediately has been observed also by Arminen and Leinonen (2004) to be frequent when dealing with locating others within the same area. The description of the caller’s location as “I’m down in the pit”, seems unproblematic to the participants. This can be seen in the fact that the description does not lead to a follow-up question, as “What do you mean by the pit?”. The laughter and noise in the background are also available to the others, so as to establish their location.

So, in this call, the participants are in the same location when the call takes place, and the call is made to make the final coordination of the meeting. This differs from the situation in the next fragment, where the positioning of the other person is done in order to know if the call can be made to a landline telephone instead.

#### Excerpt 2 (Frippe 2003-12-6 17.59.21)

```
Drunk: Hello! ((funny voice))
Frippe: Hello:
Drunk: Hello!
Frippe: What’s going on?
Drunk: What!
Frippe: Are you drunk:?
Drunk: (__)
➔ Frippe: Are you you are not at home
Drunk: Yes:
➔ Frippe: But I just called you at home=
```

Drunk: =Yes call again then  
 Frippe: (That's right)  
 Drunk: Bye  
 Frippe: You had your chance  
 Drunk: Call again then  
 Frippe: Bye:

The answerer seems to be in a bit of a joking mood; the opening greeting sequence is a bit unusual, which makes the caller ask whether he is drunk.

This conversation deals with the positioning of the answerer. It becomes apparent that the caller first has tried to reach him at home, and that the call has not been answered. There is no discussion about where “at home” is; they both have a common understanding of this. The caller had made the assumption, prior to making the call, that his drunken friend should be at home, and has therefore called his landline phone. If a person answers the landline phone, it can be assumed that the person is at home (see the discussion on Schegloff's opening sequences earlier). Consequently then, if a person does not answer, he or she is taken to not be at home.

Not answering the phone might seem offensive and impolite; there seems to be an implicit rule saying that if the phone rings, it should be answered. Nevertheless, callers often ignore this rule (Brown and Perry, 2000). Caller ID allows for screening of calls, and although available on some stationary phones<sup>4</sup>, it is an integrated feature on most mobile phones.

In this fragment, Frippe's response indicates that he thinks a phone should be answered when it rings. The fact that the phone is left unanswered is topicalized. His friend does not provide a reason for not having answered, but tells him to call again. To emphasize that Frippe thinks the phone should be answered when it rings, he says “You had your chance”, which can be seen as a reprimand.

### Where we met last time

There is a particular form of positioning using the mutual understanding of a place, that we call “where-we-met-last-time-formulations”. These are frequent in mobile phone conversations, and are quite a challenge when considering the design of location-based services.

Two examples of formulations of the “where-we-met-last-time” type are presented in the following. Both examples are calls forming part of a series of conversations, which is important to know in order to understand the talk. In the first example, the conversationalists have talked two times earlier that day, arranging a meeting at the station. One of them, Frippe, has said that he will arrive on a train to the station at a quarter past three. Marcus has agreed to meet him there. Previously, they have only referred to their meeting point as “the station”. This is what happens:

<sup>4</sup> In Sweden you also have to subscribe to a caller ID service if you want the number to be displayed.

### Excerpt 3 (Frippe 2003-12-04 15.17.08)

((Sound from the public announcement system at the station, 4.0 sec.))  
 Frippe: Hi there  
 Marcus: Hello [are you already here somewhere or  
 Frippe: [You  
 Marcus: Yes  
 → Frippe: Yep I am there where we sat e: last time  
 Marcus: Yes okay then I'll come over  
 Frippe: Okay bye  
 Marcus: >Good bye<

This conversation has similarities with excerpt 1, in that it deals with a coordination of a meeting where both parties are in the same place, and are trying to find each other within this place. As noted in the discussion around excerpt 1, in cases like these, the opening sequence can be shortened in order to quickly get to the topic. Marcus does the greeting (“Hello”), and asks the question “Are you already here somewhere or”) within the same turn.

The question whether Frippe is already “here”, shows that this conversation is a part of a series of calls concerning this particular meeting. They have previously talked about the future meeting as happening at “the station”, and once they have arrived it is talked about as “here”.

The description of Frippe's location as “there where we sat last time” seems unproblematic; Marcus immediately acknowledges and says that he will go there.

It is noteworthy also that the background noise in the opening of the call is quite clear, and it could be presumed that the participants can use this noise to understand that the other party is also at the station.

In the next excerpt, the parties of the conversation are also at the same place, and are trying to locate each other. This time the phone call takes place at a stadium where a soccer game is being played. The background to this conversation is relevant to know in order to understand what takes place. This call is also part of a series of calls, all dealing with the organization of going to the soccer game. Kenny and Eric, the conversationalists in this call, talked almost two hours before this. In that previous call, they arranged to contact each other later, when they were inside (at the stadium). They decided that Eric should call Kenny at a certain time, because Kenny does not have any credits on his phone card, and cannot make outgoing calls. Eric calls about 45 minutes later than the time they had agreed on. Two other people (here called X and Y) are also taking part in the conversation, being co-located with Eric.

### Excerpt 4 (Eric 2002-11-10 13.32.04)

((Loud chants and noise from the crowd in the background))  
 Kenny: Yeah it's Kenny  
 Eric: Yeah it's Eric

→ Kenny: Hey I'm under the Nordstan sign (0.3)  
 Eric: Okay where the hell is that  
 → Kenny: Where I was the last time  
 Eric: Okay we a::re (2.0)  
 X: We are at the edge right  
 Y: Yea:h  
 Eric: We are where the blue confetti goes up  
 Kenny: Oh yes yes ah okay:: but hey I'm here with my brother  
 Eric: Okay yeah but (0.6) okay I'll get in touch later  
 Kenny: Yeah do that  
 Eric: Bye  
 Kenny: Bye

Eric calls Kenny, who immediately after the greeting provides his location. He does this by saying "I'm under the Nordstan sign", a description that Eric does not relate to. Kenny then reformulates and refers back to an earlier event "Where I was the last time". Eric displays an immediate understanding, and he goes on to saying where he is. When describing his own location, Eric hesitates, and gets assistance from two co-located people. Eric. Kenny displays that he has understood where Eric is ("Oh yes yes ah okay::").

They end the conversation without deciding to meet. In this sense this call is very different from the other calls presented here, where people have been in the same place and calling each other to manage to meet up. Rather, this call contains a positioning of both parties, with no action. There might be several reasons why this is so. They are both apparently with other people, so none of them are alone at the game. Kenny can know that Eric is not alone from the fact that two other people get involved in the description of the location, and Kenny says that he is with his brother. The fact that Eric calls much later than they had agreed on, might imply that what they had talked about previously about meeting up inside, is no longer relevant.

### So you'll be here in five minutes

As we have seen, positioning in everyday talk builds on mutual understanding of places. In the last two phone calls presented in this paper, we will see how, when coordinating a meeting, location is oriented to in terms of what it means to move between the locations of the parties.

In the next excerpt, the caller volunteers to describe her location, although it has not been asked for and is not treated as particularly interesting by the answerer. Nicky gets a call from someone who is on a bus, and is late for a meeting they both are going to.

#### Excerpt 5 (Nicky 2001)

Nicky: Yeah it's Nicky  
 Sandra: Hi it's Sandra  
 Nicky: Hi  
 Sandra: You're going to the meeting or?  
 Nicky: What did you say  
 Sandra: You're going to the meeting?

Nicky: I'm going to the meeting yes  
 → Sandra: Yeah I'm coming I'm coming quarter twenty minutes late just so start without me  
 Nicky: Okay yeah but that's cool  
 → Sandra: I'm sitting on the bu+ I'm sitting on the bus now I'm almost at Backaplan soon so that  
 Nicky: Okay that's cool  
 Sandra: Good  
 Nicky: Ah h: hi  
 Sandra: Hi:  
 ((Ends phone call))  
 Nicky: ((to herself or co-present)): but shit I can't take that card

The reason for this call is that Sandra is running late for the meeting. When Sandra says that she will be a quarter to twenty minutes late, Nicky seems to want to end the topic already<sup>5</sup>. She says "that's cool", but Sandra continues to explain where she is. It is interesting that she continues, although Nicky has already indicated that it is okay. The caller goes on to give her location, that she is soon at Backaplan. Her location can be used by Nicky to understand the estimated time of Sandra's arrival to the meeting. Her location is thus relevant for the future activity, and this might be why it is provided even though it already has been said that her late arrival is not a problem. In fact, the words "so that" indicates that her location should be taken as meaning something in terms of her arrival; something like "I'm almost at Backaplan *so that* means I'll be there in X minutes". Backaplan is a place that is known to the answerer, which is evident in that there are no follow-up questions about this. Presumably, Nicky also sees it as unproblematic that she is traveling by bus, and that passing by Backaplan is a reasonable route to take to where their meeting is.

Laurier (2001), in discussing accounts for running late, argues that one reason for providing more information to the answerer, can be to give the answerer an account to then relate to other persons going to the meeting one is running late for. This might also be part of the answer to why Sandra goes on to make a second statement about her location; to give Nicky some information she can use when saying that Sandra is late for the meeting.

The mobile phone provides a tool to do just this sort of micro-coordination (Ling and Yttri, 2002); calling and saying that one is late for a meeting. The possibility of making a call if one is late might also lead to a pressure to call and say if one is late.

<sup>5</sup> One explanation to why Nicky does not display an interest in discussing further where the caller is, and what time she can be estimated to arrive, might be because Nicky is occupied doing something else when she gets the phone call. Nicky forgets to switch off the recording machine, and so it becomes evident from what she says after having ended the phone conversation, that she is busy doing something else. Therefore, presumably, she wants to end the call. This information is available to us, but not to the caller.

In the conversation above, the place description (Backplan) was treated as unproblematic, and the conversationalists could establish a mutual understanding of the whereabouts of one of them, in relation to their meeting place. In the next fragment, the caller's location leads to more discussion before an understanding is reached on what it means in terms of their meeting.

*Excerpt 6 (Hans 2003-12-4 18.22.52)*

(...)  
Saab driver: Yeah we're leaving from the burger place at the Delsjö exit now  
Hans: Delsjön?  
Saab driver: Yes it's right above you for fuck sake (0.4) on the way to Landvetter  
Hans: Oh:: >where's< what burger place  
Saab driver: (1.0) Burger King  
Hans: Oh yes yes there you are (0.5) [yes yes but then you'll be here in about five minutes then  
Saab driver: [Yes  
Saab driver: Exactly  
Hans: That's good then then I'll make sure to come [down then  
Saab driver: [It's that we're driv+ we're driving Saab  
Hans: Yes  
(...)

The presentation of the caller's location, the burger place near the Delsjö exit, is not immediately understood by the answerer. Judging from the swearing, it seems as if the Saab driver believes that the answerer should be able to understand where they are based on this description. He continues to go on and specify the place, using the brand name of the specific burger place they are just leaving, and finally Hans displays an understanding - "Oh yes yes there you are". Once an understanding has been reached, Hans directly presents a suggestion to how long it would take the Saab driver to reach "here", i.e. where Hans is located. The Saab driver agrees to this suggestion of how long the journey to "here" should take. Note also that the caller, the Saab driver, relates to the location of the answerer from the beginning, which is visible in "it's right above you".

## DESIGN CHALLENGES

Based on the findings presented in the previous section, we move on to discuss how the existing positioning practice challenges the design of location-based services.

We have tried to show in this paper how location is something which is made relevant to the participants in different ways for different purposes. In the existing practice of describing location, it is the particulars of each occasion, that effect the ways in which the location is formulated. This means that there is no single static way to present location, it varies according to the occasion and can be seen as ongoing achievement, produced by participants.

Similar arguments have been made when discussing context-aware services. Dourish (2004) argues that context

is a feature of interaction, an occasioned property, which is particular to each occasion of activity or action. Context is not just "there", it is produced and maintained.

In the same vein, Brown and Randall (forthcoming) argue when discussing context-awareness, that it can be useful to merely provide context to users, and let them make sense of each other's actions.

Drawing upon these discussions and the findings presented in this paper, one approach when designing location-based services, might be to merely provide the location information, and let people make sense of what it means. The technology should support people doing the work of positioning.

A location-based service is a tool to be used by people, and the technology does not have to "understand" what location means to people, rather it can communicate the location to people who can make sense of it themselves. Having said that, we still believe it can be worth trying to exploit the current practice of talking about location, and not remain with the now prevailing way of presenting location in geographical terms.

Further, this paper has shown examples of how people *actively* communicate their location, telling others where they are and where they are heading next. However, it should be remembered that most existing services do not build on the idea that people actively give their location to other people. In some services, the users are even unaware that someone else is looking for them. So for instance, the Friendfinder service does not give any information that someone has just found out the location. In the Botfighter game, although the idea of the game builds on location, it is also of interest that other players are lead to believe that one is somewhere else, to avoid being "shot". In this game, as opposed to the Friendfinder service, the users can see that someone else has searched for them. In that sense, there is a little more collaboration, and both sides are more actively part of the positioning. Still, a direction for future design worth exploring could be to integrate features allowing for collaboration, by making the ongoing negotiation of a location part of location-based services as well.

Hand in hand with the notion of location being collaboratively and ongoingly negotiated, goes the ways in which this is done. In this paper, we have seen how people position each other using talk. However, existing systems and services are all visual. In a previous study of a location-based system used by mobile workers, Juhlin and Weilenmann (2001) have shown how it can be problematic that a system relying on visual information does not give the information needed about next action. For the people studied, mere information about the location of others was not enough to be able to carry out the work. This lead users to rely on other means for negotiating the meaning of the visual representation, a small dot on the map, namely talk. By talking over the mobile radio, in this case, they could know what their co-workers were up to next, assigning

meaning to the location presented by the system. A great challenge when designing location-based systems is to allow for this ongoing negotiation of what a location means.

Several research projects are currently focusing on building new location-based applications. Some of these reason about location along the same lines as described in this paper. For example, Ashbrook and Starner (2003) note in their work on predicting a user's future movements that "[i]t would be quite useless to tell the user, 'You're currently at 33.93885° N, 84.33697° W and there's a probability of 74% that you'll move to 33.93885° N, 84.33713° W next.'" Instead, we would like to find points that have some significance to the user and perform predictions with those." (ibid. p. 278).

Similarly, Hightower argues in his paper From position to place (2003), that "[e]merging proactive applications want to reason about "place", not coordinates." For the purpose of this work, place is defined as a human-readable labeling of positions. Hightower points out that existing systems rely on manually defining places, and while he believes this is useful, it does not scale to ubiquitous deployment. Therefore, he argues that for these systems to be successful, they have to be able to automatically predict, learn and label places.

As a final note, we want to argue that it is a useful approach to put such systems to use and test them in real-life scenarios. A next step is therefore to design prototypes and evaluate them in naturalistic settings, in order to see how they fit with the current practice of positioning.

## CONCLUSION

In this paper, we have argued that it is valuable to understand the current positioning practice used by people to coordinate meetings and talk about each others' whereabouts over the mobile phone, in order to design relevant and useful location-based services. We have presented a study of mobile phone talk, and the detailed analysis has revealed the following practice:

- *I'm at home.* People use their own common terminology to talk about places which are familiar to them, e.g. "at home", "in school", "the pit".
- *Where we met last time.* A formulation of location often uses terms which relate to previous background between callers. A common way to talk about location is to use what we call 'where-we-met-last-time-formulations'.
- *So you'll be here in five minutes.* When coordinating a meeting, location is oriented to in terms of what it means to move between locations. A formulation of location is selected which is enough to give an approximate time of arrival.

Based on these findings, we have discussed a number of challenges faced when designing location-based services. We have argued that rather than seeking to replace the current practice with technology, the aim should be to

enhance and support it, in order to make location-based services which are relevant, innovative and perhaps also fun to use.

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#### APPENDIX A: TRANSCRIPTION NOTATIONS

Brackets	[ ]	Marks the beginning and end of temporal overlap among utterances produced by two or more speakers.
Timed silence	(1.3)	Measured in seconds, a number enclosed in parentheses represents intervals of silence occurring within (i.e. pauses) and between (i.e. gaps) speakers’ turns at talk.
Micro pause	(.)	A timed pause of less than two tenth of a second.
Underscored text	–	Underlining indicates emphasis.
Colon(s)	:	A colon indicates prolonged segment. Longer enunciation can be marked by two or more colons, e.g. e::h.
Question mark	?	Rising inflection, not necessarily a question.
Exclamation point	!	Animated tone, not necessarily an exclamation.
Greater than/Less than signs	> < < >	Portions of an utterance delivered at a noticeably quicker (> <) or slower (< >) pace than surrounding talk.
Capitalization	AND	Words in capitals are spoken louder than surrounding talk.
	Hh	Audible expulsion of breath as in laughter, sighing, etc. When aspiration occurs within a word, it is set off with parentheses.
	+	Interrupted speech
Parentheses	( )	Text enclosed in parentheses represents transcribed talk for which doubt exists. Empty parentheses represent untranscribed talk or unknown speaker.
Double parentheses	(( ))	Transcript annotations.