

Motorcycling and Social Interaction - Design for the Enjoyment of Brief Traffic Encounters

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ABSTRACT

We report an ethnographic fieldwork that reveals the importance of social interaction, and especially traffic encounters, for the enjoyment of motorcycling. Motorcyclists spend an appreciable amount of time on the roads to meet other bikers. During the brief traffic encounters, they interact visually by means of their driving, their choice of bike and personal equipment. We uncover problematic issues in this practice and how these are currently addressed. The activities on the roads are partly arranged, and partly complemented by the use of a public message-board on the web. The findings are summarized as a set of implications informing the development of the Hocman prototype. Hocman is a mobile HTTP peer-to-peer application, which supports social interaction between motorcyclists.

Categories and Subject Descriptors

H.5.3 [Information Interfaces and Presentation]: Group and Organization Interfaces – Computer-supported cooperative work

General Terms

Design, Human Factors

Keywords

Bikers, social interaction, traffic encounters, ethnography.

1. INTRODUCTION

Two bikers passing each other in high speed along a highway may not seem like a social event. However, in the following we present the findings from an ethnographic fieldwork on motorcyclist, which displays their appreciation in traffic encounters with other bikers. Their concern in the encounters is visible in the way they wave to each other

and how they engage in discussions on public message boards on the web to sort out encounters in retrospect. In order to make motorcycling even more enjoyable, and brief encounters more stimulating, we propose the Hocman prototype [9], a service supporting social interaction between bikers. Finally we present initial findings from a field trial [10]. The results indicate that the conceptual idea of Hocman was appreciated, which suggest that the focus on interaction in traffic encounters fit with current practice of motorcycling.

During recent years, the CSCW-research has experienced an extension of the scope to also include studies on leisure activities. This movement from traditional studies in work settings has provided the audience with research on activities such as: mobile phone use among teenagers [25], the collaborative activity of being a tourist [4], and instant messaging [12]. These studies illustrate the possibilities to apply traditional CSCW research methods to these contexts, but also the relevance of findings from these contexts to core CSCW issues [4].

Motorcycling is a highly mobile activity where people spend a considerable amount of time on the roads mostly for the sake of enjoyment. The driving experience is central, and a principal reason for this is the strong tactile experience given by the roar and vibrations of the engine, as well as being exposed to wind and weather. However, the activity is also social, seeing that the bikers appreciate riding even more if they are likely to encounter other bikers. There are several forms of social interaction. We argue that the brief and random encounters along the vast road network are fundamental in biking. The traffic encounters are sometimes enjoyed for their own sake.

When being out on the roads, during these brief meetings with other bikers, they interact with a quick nod or wave. Additionally they pursue visual interaction by the display of equipment and actions for others to see. They also seek to organize the motorcycling to increase the likeliness of meetings. Furthermore, they complement traffic encounters with other forms of interaction, e.g. traveling in groups, meeting at certain places and using public message boards on the web. However, these alternatives are all compro-

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mises to the much appreciated and spontaneous traffic encounters. *First*, traveling together with a small group of acquainted bikers is predictable. *Second*, meetings at certain places compromise the driving experience. *Third* the use of Internet contains no driving at all. Thus, biking is somewhat at contradictory practice. The strong focus on driving, the speed and the motorcycle, are important prerequisites. However they are all hampering factors for interaction with like-minded.

The knowledge gained from the empirical fieldwork brings forth new issues to the research agenda of mobile CSCW. The bikers being engaged briefly and being enclosed by their helmet and speed, governs the social interaction in these situations. The specific features of the traffic encounters are overlooked in related research and therefore their approaches would not be successful. The work also relates to research on social interaction in communities. However, the study differs in the way it moves away from the narrow focus on activities taking place in online communities only. We rather bring forth a community that relies on the reciprocal action of activities in the real, i.e. on the roads, and what is happening online, i.e. on the message board. We argue the importance of understanding this collaborative nature of biking, in order to suggest a service supporting the motorcyclists.

The paper is outlined as follows; we start by giving a brief account for related research. We then move on to introduce the method of studying motorcyclist, and the setting of the empirical study. In section 4 we bring forward details, and analysis from the fieldwork. The findings are summarized and introduced as a set of implications that inform the design of Hocman. Section 6 gives a brief introduction to the prototype. Finally, before summing up the paper, some initial findings from a field trial with real users are introduced.

2. MOBILE COMMUNITIES

Seeing that parts of the activities connected to biking takes place on the Internet, our understanding of the social interaction relates to studies that have focused on online communities [22]. Traditionally the focus has been on the use of Internet to support online communities, such as MUDs [7], virtual communities [17] or newsgroups [24]. In these social environments people still meet face to face, but under new definitions of ‘meet’ and ‘face’ [23]. Despite the fact that some studies discuss geography-based online communities [21] they rarely discuss the connection, and dependency, between activities taking place in the real world and those which takes place online.

For the reason that we explore a community relaying on the alternation between activities in the physical and online, we also relate our work to existing mobile services supporting social interaction, such as in interpersonal awareness devices [13, 2, 3, 18]. In these research projects they propose

badges, devices, and software applications to provide interpersonal awareness and support collaborative activities among groups of users. They vary in their ability to mediate personal expression. However they all have in common that they are designed for semi-stationary settings. The users must be in close range, standing still or moving slowly relative to each other. Systems designed for such settings are not applicable for bikers that move in high speed over large areas. Moreover, these systems share rigid and highly structured data, both in terms of content and format.

3. STUDYING MOTORCYCLING

The fieldwork was carried out in the region of Stockholm between July and September 2001. It was conducted by one of the researchers who owns a bike and uses it daily during summers.

Knowledge about users’ social practices is an important resource when developing support for situation dependent interaction. The users often find it difficult to express the logic and methods of their collaboration and interaction. To overcome this we apply techniques of ethnographic fieldwork, which involve, the researcher participating, overtly or covertly, in people’s daily lives for an extended period of time [14, 15]. However in respect to the nature of biking, i.e. bikers driving in high speed in a vast road network, the difficulties in gathering data on social interaction taking place on the roads, we had to use complementary methods in addition to participatory observation. Hence, our approach was to complement it with data from other interactional events. The latter form of data is also used to discuss and explore the traffic encounters.

The researcher participated at several local events, i.e. visiting known meeting-places and partaking in joint trips, in the area. Specifically, he attended ten weekly biker meetings at “the Yellow Café” each with approximately 300 to 400 participants. He also participated in three organized one-day tours, each with a minimum of 10 000 participants. During these trips, open-ended interviews were conducted and recorded. During the initial part of the fieldwork, we discovered a public message-board on the web (see details in section 4.2 Expressing Identity and Community Membership), which was very popular among the bikers. Some bikers using a sweater with an URL printed on the sleeve announced the presence of the message-board. Consequently, in the remaining of the fieldwork we visited this message-board practically on a daily basis. It played an important role in the motorcyclists’ activities and was a popular site for discussions, with approximately 300 registered users and 5000 visits each week. We choose this loosely coupled group of bikers in view of its popularity and seeing that it was possible to follow their activities on the Internet, as well as parts of their road-activities. The

data gathered on the Internet has been used both as empirical findings on the activities on the web, but also to discuss their activities on the roads.

The empirical material, from motorcycling; visiting meeting-places; following joint trips; conducting interviews; and observing the postings on a community website, which includes field notes, recorded interviews, as well as recordings of the message board, were transcribed and coded. The diversity of the data gave us the opportunity to think about, and explore what motorcyclists do, in a number of different ways. When analyzing the transcriptions, we aimed at producing a general understanding of being a biker, as well as specific knowledge on social interaction during traffic encounters. We went through the transcriptions, identifying a set of themes. A few sequences from the transcribed recordings were then chosen to illustrate the topics we examine in this paper.

The project concerned the generation of a new service, achieved through a process involving; preparation through empirical fieldwork; generation through associative work in an interdisciplinary research group; and finally evaluation of prototypes in the context of system use [6, 8, 19, 26]. The discussion took place in an interdisciplinary research group [6] that combines an interest in social science with mobile computing. The composition of the group conveys that the discussions are grounded in the empirical findings, but also technologically informed by an understanding of viable solutions. Reaching the final design constitutes a complex procedure difficult to capture in detail. The development has involved the designers in a dialogue with the materials of the design situation, from which the design problem and its solution are worked out simultaneously [11]. However, the findings from the fieldwork played a major role in the design process, where they informed the development of the prototype. When the fieldwork came to an end, the discussions on feasible design ideas resulted in a tangible proposal. To verify the empirical findings, as well as the resulting service developed within the project, the last phase contained an evaluation. A *field trial* [10] was set up, where a group of six bikers had the opportunity to use the prototype for a restricted period of time in its intended setting i.e. on the roads. We conducted two separate trials, which engaged three test subjects each time. We set up rendezvous locations along the route at suitable parking lots. The participants should stay unacquainted during the trial, and only meet during traffic encounters to best represent realistic situations. We argue this approach gives an opportunity to obtain holistic data on usage. However, we found it very difficult to observe the actual meetings as they took place. Instead we settled for semi-structured interviews [16] of each user performed immediately after the trial. The interviews were performed in parallel with different investigators.

4. BIKER INTERACTION

In the following we introduce the activities that constitute biking. The main part of the analysis deals with the specifics of social interaction, and how the motorcyclists attempt to organize biking to increase the likeliness of individual encounters. They appreciate interacting with acquainted as well as unacquainted bikers. It takes many forms such as ordinary traffic encounters, at meeting-places given by tradition, during joint trips and interaction on the web. These will all be given an account for in the following sub-sections. However, we will begin by describing the basic condition, i.e. the enjoyment of driving.

4.1 The Enjoyment of Driving

The driving experience is central in motorcycling. A principal reason for being a part of the biker community derives from the appreciation in the strong tactile experience given by the roar and vibrations of the engine, as well as being exposed to wind and weather. The bikers spend time on the road to experience the feeling of acceleration and the centrifugal force when taking turns. Accordingly bikers, for the single reason that it is fun to drive, can crowd winding roads far from well-populated areas. During the fieldwork we observed lots of other bikers on this type of roads. Additionally, in the videos published on the website, these winding roads were more frequent than others. During these journeys, it is of great importance to control the bike, e.g. to be able to keep a high speed when taking the turns.

These roads are often very popular, and well known in the biker-community. The knowledge of the ‘enjoyable’ roads is passed around by word of mouth, on motorcycling websites, or as in some cases, marked up on certain road maps, sold by motorcycle-clubs.

4.2 Expressing Identity and Community Membership

Considering that certain road sections, or places, attract more bikers the probability to encounter others are of course higher. Consequently, these places are favorable when showing off, seeing that an audience is a prerequisite for this kind of activity.

Biking provides an opportunity to express an identity. In general, biking is seen as different from society whereas it provides a feeling of freedom and individuality [20]. The bikes are designed to provide impressive performance and appeal [20], beyond the logistical demands of a transport vehicle. But it also provides opportunities to express more specific identities by the means of design of the bike, the clothes and the driving.

Their way of expressing themselves was visible in their handling of the vehicle. It was important to handle the bike in an impressive manner, for example doing “stoppies” where they brake hard with the front wheel in a way that makes the back wheel lift up in the air (Fig. 1). Further,

they spend considerable resources to modify their bikes to stand out from the rest. They not only attempt to stand out from all other road users, but also within the group of bikers. During the fieldwork we noticed the popularity in discussing and displaying motorcycle modifications. This standpoint is expressed in interviews conducted at the large organized events, but also observable in the weekly informal meetings and on the message board. One person expressed it in the following way:

It is rather interesting if there is something more than the ordinary. It doesn't need to be a special bike. It is interesting enough if they have made some modifications... On this one [pointing at his own bike] there are always discussions concerning the high performance exhaust pipes and how to increase the motor power...

Modified bikes receive attention and comments irrespective if they appear at the meetings, or in a picture-gallery on the web. The importance of expressing the 'right' attitude did also influence the choice of personnel equipment. It should not only protect from injuries, it also had to have the correct appearance, or display the belonging to a certain group. For example, we observed how some bikers used a sweater with an URL to a public message board printed on the sleeve. This phenomenon was not very widespread in the initial part of our study, but gained in popularity during the summer. Consequently the number of visits on the message board increased throughout the summer.

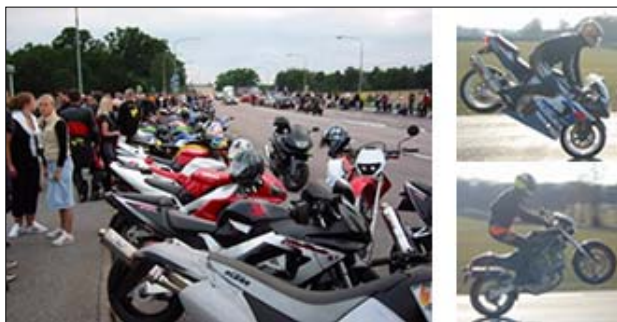


Fig. 1. Pictures from the weekly meeting at the “The Yellow Café” (to the left) and motorcyclists performing stunts (to the right).

Many of the bikers express their identity on the web by using pictures or movie clips displaying their bike, or demonstrating their skills. They use thumbnail pictures in their signatures to show off, and take an interest in giving and receiving recognition for each other's performance. This is similar to what they are doing on the roads. The possibilities for lengthy interaction on the message board are superior to what is provided for during the brief encounters along the roads. Besides, the asynchronous use of the web site compensate for the difficulties in reaching an audience. The thumbnails also facilitate the coupling between individual members of the message board and the bikers

met on the roads, reconciling the on-line and the physical. However, interaction on the web is different from all other form of biking interaction in that it lacks the driving experience per se.

4.3 Traffic Encounters

The traffic encounters take place as an ordinary part of biking, irrespective of place. However at some road sections they occur with a higher frequency. One obvious example in the region is on the highly popular road-sections, such as the winding roads northwest of Stockholm. During the weekends large amount of bikers drive the route for the only reason to drive along the curvy roads. They drive in both directions, and consequently several encounters occur.

In view of the high speed there is no time for prolonged, or even brief, interaction during the swift encounters on the road. The possibilities for direct communication with each other while biking are scant. Still, we argue that most bikers engage in the interaction in an encounter with another motorcyclist beyond what is necessary for coordination. It is observable in the ways in which they put an effort into these meetings during them as well as after them. During the meetings, they greet each other and interact with a wave, or flashing with the lights.

Their appreciation in traffic encounters is also expressed in interviews during our fieldwork. One person articulated in an interview, that he greeted almost every biker he met on the road. This appreciation in meeting other bikers is also commented upon in other studies of motorcycle communities [20]. We argue that the individual appreciation of a traffic encounter possesses in many cases some of the characteristics as what appeals to the flâneur.

“[t]he flâneur wanders without aim, his stroll is punctuated every once in a while by looking around. Without aim? That aimless stroll is the aim..” [1]

The biker and the flâneur are similar in the way that they move along without any specific aim. They are not traveling to a specific place; rather the driving is the goal of the ride. Parts of the pleasure come from enjoying the scenery, but also from observing the other bikers in the vicinity.

4.4 Handling Traffic Encounters in Retrospect

In the following we will show both how they use message boards on the Internet in connection to real world activities, as well as how the brief encounters is a topic for the discussion. The appreciation of traffic encounters is observable in its role as an often-recurring topic in discussions among bikers at the message-boards on the web. Out of ninety-one recordings from the message board, twenty-three of them concerns, earlier encounters along the roads. Often, the web is used to find persons with similar local interests to discuss the situations.

This mutual interest in traffic encounters is evident in the excerpt given in Fig. 2. In this specific case, a group of bikers make an effort to identify a motorcyclist someone saw being hailed by the police. The discussion is held during the evening, after a day filled with activities on the roads.

1 (23:28) **Alex:** Saw a white/red/blue (?) CBR 900 which
 2 had been stopped at the Uppsala exit on the Stockholm
 3 highway southbound this evening around 11 pm. Was that
 4 one of 'us' and if so how'd it go? I buzzed by at a steady
 5 70km/h and felt bad for you... think it was the dark blue
 6 unmarked 850 seen earlier that evening which stopped
 7 the bike in question...
 8 (23:31) **Michael:** Sounds like Eric unfortunately!!! ☹️☹️☹️
 9 He rides that way anyway, really hope it wasn't him, in
 10 any case that's really too bad. ☹️ Hope he doesn't lose
 11 his license!
 12 [excl. transcript of one posting]
 13 (23:34) **John:** They just never give up. Saw him waiting
 14 there on the on-ramp right when I was getting ready to
 15 go for a wheelie. After that it was 70 all the way home.
 16 Almost forgot how slow that is...
 17 (23:36) **Peter:** Sh** man... that sounds like Eric... he
 18 dropped me off here in Gävle then he took off for home...
 19 do you have to go by Uppsala if you're going to
 20 Västerås?
 21 (23:39) **John:** Heck of a detour via Uppsala from Gävle.
 22 Can't have been Eric unless he was really itchin to ride...
 23 (23:39) **Richard:** Nope you don't go by Uppsala if you're
 24 going to Västerås...that was probably someone else
 25 unless he went the wrong way...Keep your fingers crossed
 26 for whoever it was anyway. Also I think we should take it
 27 a bit easy with names and the like from this evening...it
 28 seems we've stirred things up tonight...
 29 [excl. transcripts of two postings]
 30 (23:48) **Peter:** There's a real chance Eric got lost on his
 31 way to the freeway tonight... ☹️ He ought to be home soon
 32 and be able to answer..
 33 (10:07) **Alex:** I dunno...probably wasn't Eric... was a lit-
 34 tle newer bike than what he's got...I'd guess between 97-
 35 00 but I only saw it for a sec and it was dark so I could be
 36 wrong...well well, just hope things turned out all right
 37 (11:23) **Eric:** Nope! It wasn't me...whew! Lucky. There
 38 was a lot of the back wheel going home. Thanks for the
 39 kind thoughts anyway. I only got stopped by the police at
 40 The Yellow Cafe at 0 km/h.

Fig. 2. Excerpt from the message board, displaying the collaborative effort to identify a biker.

At the end of the evening, Alex has seen a white/red/blue CBR900 stopped by the police, at the exit to Uppsala. After returning back home to his computer, he logs on to the message-board and initiates the discussion by asking whom the police hailed. Michael (line 8) guesses it is Eric based on the description of the bike. Peter (line 17) agrees, telling that he was probably the one who met Eric last. Later postings oppose to the conclusion that it could be Eric, since this would not be the ordinary route for him to drive. The mystery remains to be solved until Eric ends the discussion

(line 37) twelve hours later. Luckily, he was not the one who got caught by the police.

This excerpt illustrates both the special character of those meetings as well as their interest in the encounters. First, even though the bikers had actually met during the day, and there were a source for concern of the welfare of one of them, the bikers were even unsure about who they actually encountered. Second, the encounter only gave a short glimpse of the activities that occurred, which called for elaboration.

In general, there is a great deal of interest in a specific traffic encounter, in this case identifying the motorcyclist stopped by the police, since they think it could be a member of the group. This is evident in line 4, where Alex asks if the biker was one of *us*. Also the amount of postings, ten messages on a time span of twenty minutes, displays the interest to sort out the issue.

Finally, during the brief encounters they look for icons and messages on the clothing, as well as characteristic features of the bikes to identify the other person. It is important to correctly identify a biker in order to give credit, or to place him or her as a part of a specific group. This argument is supported by how they discuss issues of identification on the web, rather than what is possible to observe in their behavior on the roads. In the excerpt above it is evident how they benefit from the details caught during the brief encounter. In line 1 the biker is described by the colors of the bike and which model. Later in the discussion, i.e. on line 33, the same person adds some details regarding the age of the bike. He also refers to the complexity with the brief moment of interaction and the darkness.

Further, the encounters play an important role seeing that their web site increases in popularity, with a growing number of visitors. This could be explained by their use of sweaters with an URL printed on the sleeve, which have been displayed during encounters on the road.

4.5 Arrangements to Increase Social Interaction

Social interaction among bikers takes place in many other forms and settings than the brief and random traffic encounters. The chances for social interaction with unacquainted bikers are rather low since the roads constitute such a vast public place. Moreover, even if a biker wants to meet someone acquainted it is still improbable to randomly come across that person. Consequently, the bikers have developed many ways to increase the likeliness of enjoyable social interaction.

One way of increasing interaction, which we have observed, is to move around a specific site. When revolving around a specific site they always return for another encounter. The stage is often given by tradition, i.e. places where bikers usually meet. However, the site can

also be selected through contingent negotiation, for instance, by mobile phone communication. During the summer there is a weekly gathering at a specific place, here called “the Yellow Café”, in the outskirts of Stockholm (Fig. 1). Each Wednesday approximately 300-400 bikers turn up at the specific place. A good portion of the activities taking place here concerns showing off. This interaction normally concerns indirect and superficial matters. They impress each other with newly modified bikes, equipped for instance with high performance exhaust pipes, modified breaks, seat cowls, etc. They also show off by performing stunts, such as balancing on the front, or rear wheel. During the evening motorcycles constantly arrive to, or leave, the place. Often towards the evening smaller groups end up leaving the place and heading towards more quiet areas such as industrial sites, where they race against each other.

During these informal meetings, they use their motorcycles, or themselves, to carry information. They benefit from the number of bikers present, by equipping their bikes with for-sale ads, or with stickers expressing their membership of various groups. At “the Yellow Café”, they park their bikes alongside the road and walk around watching and commenting on other bikes. They often show interest in bikes either similar to their own, or ones they find spectacular.

Another way of increasing interaction is to travel together. Bikers organize trips, for example to explore untried roads with familiar bikers; to teach each other how to maneuver on familiar ones; or to simply go together to enjoy the bends on a particular route. This sometimes occurs as a consequence of the informal meetings, i.e. when leaving the place in smaller groups.

These two examples, meetings at a certain place and joint rides, differ from the experience of ordinary traffic encounters. Considering the main issues for being a biker, e.g. the pleasure of driving; expressing identity; and social interaction, informal meetings increase the means for social interaction. We observed how they walk around to meet and discuss with acquainted as well as unacquainted bikers. In this not very mobile setting, the possibilities for expressing identity are rather good. The bike and the personnel equipment could easily be displayed, and consequently observed. However, it does not give full satisfaction of the demand for a good driving experience. Seeing that the activity is concentrated to walking around between the parked bikes, it contains no driving except from the ones who are showing off, and perform stunts in front of the other bikers. The joint rides have the opposite qualities. It provides a decent driving experience. But the increase of interactional events is restricted to acquainted bikers, which compromise the experience of the driving flâneur.

4.6 Planning a Joint Ride

Motorcyclists have come to embrace the web to further increase interaction. Several motorcycling web sites have recently evolved in Sweden. Except from elaborating on earlier brief encounters, as illustrated in section 4.4, they use the message-boards to plan and organize their driving. The site we have studied hosts a number of other discussions related to motorcycling such as expressions of identity, negotiations of appropriate behavior, and arrangements of biking.

In the following we will discuss the message-board as a way of increasing the likeliness of interactions on the road by arranging a ride. The excerpt from the message board depicted in Fig. 3 illustrates how a group of bikers organize a joint ride. It indicates the problematic issues that arise when deciding on time and place for them to meet, especially when the discussion is public, continues for a longer period of time, participants drop in and out of the discussion, etc.

1 (09:03) **Richard:** I CAN'T TAKE IT ANY MORE! We
 2 have to get out and ride on wed again...who's coming?
 3 come on now, there should be more of us than ever...after
 4 all I'm going to show you what I've learned...I'm going
 5 to fall on wed..... muhahahahahahaha!!!!
 6 [excl. transcripts of eight confirmations]
 7 (22:30) **Bill:** Couldn't we meet at mcd in Tyresö instead?
 8 Maybe we could race a few times before all the "Bike-
 9 haters" go to bed. It'd be so f**ing great if we could do it
 10 before the cops arrive. ☺
 11 (22:43) **Eric:** I guess I'll be there and it doesn't matter to
 12 me where we meet.. If we meet in Tyresö then we could
 13 take a ride on curvy and nice roads down towards
 14 Nynäshamn ☺ Bill, you want a revenge race, right? ☺
 15 (22:45) **Bill:** Any time!
 16 (23:18) **Peter:** If I get my piston rings like promised to-
 17 morrow, then I'll probably be able to take a ride with
 18 you! In any case I want to go to the Yellow Cafe first....
 19 (09:38) **David:** Coming later, have to work at a race first.
 20 Ought to be in at Svea by about 21. And you guys who
 21 are out earlier, be sure to let loose properly, preferably
 22 right by Chairman Bluelight on one wheel.
 23 (14:40) **Richard:** Awesome!!! but I'll probably go to
 24 Donk's on Sveavägen...18:15.18:45 C U WHEN YOU
 25 GET THERE
 26 (15:46) **Ralph:** F**, is it raining up there in Stockholm?
 27 Here in Gothenburg we're suffering from brilliant
 28 sunlight...well ok some cumulous clouds ☺I'm in the best
 29 mood there is because my buddy's gonna drive me my
 30 22km home from work on his new fireblade ☺☺☺ oh
 31 believe me if you don't have a bike and have only passed
 32 the theory test then this is the closest thing to total happi-
 33 ness you can get!!!
 34 [excl. transcript of one posting]
 35 (16:35) **Steve:** Coming, absolutely...☺
 36 (16:37) **Steve:** Forgot...was it Tyresö or Svea????? ☺☺
 37 (03:45) **Steve:** Okay I'll swing by Tyresö first hope
 38 there's some carrots there, otherwise i'll/we'll come to
 39 Svea....☺

40 (08:48) **Michael:** I'll come sputtering into Ronald's
 41 Place except in the event of precipitation...Seems like
 42 there's some mixed signals about where to meet and what
 43 time but I vote we just ride like usual, it doesn't get so
 44 complicated that way....☺
 46 (16:52) **Phil:** McDonalds right??? What shitty weath-
 47 erwe got!!!! The Weather gods must love us carrots!!!!
 48 (17:05) **John:** In at the last minute, are you guys going
 49 out to the yellow cafe or will it be some other local
 50 route? I won't be coming to the M, am sitting at work in
 51 Solna, will probably ride directly to the cabin and have a
 52 look then we'll see if I find any carrot peels.
 53 (17:11) **Robert:** McDonalds we'll be driving at between
 54 18:15-18:45...(like usual that is)...☺☺
 55 (17:14) **Paul:** Have to see if you all still around when I
 56 get there. Have to go home and get the bike first. Other-
 57 wise see ya'll somewhere else along the way.

Fig. 3. Excerpt from the message board, displaying the collaborative effort in organizing a joint ride.

Richard initiates the discussion by inviting the others for a joint ride two days later. The interaction goes smoothly during the next eight turns, i.e. while people only accept the invitation. It starts to get complicated when Bill (line 7) starts to negotiate the invitation and suggests another meeting place. This suggestion is explicitly confirmed by a second person (line 11). Then follows a series of short confirmations, which do not make it explicit whether they mean the first or the second place. Then David confirms the first place (line 19). Thereafter Richard, who made the initial request, acknowledges all those confirmations without commenting upon the discussion on a possible second place (line 23). The confirmations and the discussions continue, but nothing more is heard of Richard, Bill or Eric. In line 36, one of the participants raises the questions as to which place he has agreed to go to. He gets no answer for eleven hours and then puts up a message that he will go to both places! In line 40, Michael complains that they have not come to any conclusion regarding either time or place, and instead suggests that they should do it the traditional way.

Much effort is put into deciding the specific place and time, but it is still not obvious when and where to meet, and who will turn up. We think that the deficiency of this particular interaction is due to two issues. First, it is difficult to reach consensus since the participants step in and out of the forum in unpredictable ways. When a message is posted it is not immediately obvious who receives it. This is the case where the objections to where to go, in line 7, are left un-commented. The cause may be the initiator (Richard) having already left the forum and thus not being available for negotiation. It is also difficult to repair misunderstandings, as visible in the eleven-hour delay to the request for clarification made by Steve on line 36. Second, the process of achieving mutual agreement is flawed by the website being public. People not familiar with the context may confuse the discussion. This is visible in the digression

made by Ralph on line 26, where he posted a comment on the weather in a different city. There could also be case of subtle digression in line 7. The objection by Bill is perhaps ignored due to the fact that he is being in the fringe of the group, lacking context awareness, and being unacquainted with what he may suggest. This may explain why Michael and Robert later, on line 40 and 53, state what the group usually does on Wednesdays, i.e. where they meet and at which time.

To conclude, the web-message board serves the purpose of simultaneously reaching a number of likeminded e.g. when organizing joint rides. However, some deficiencies do occur. It is an asynchronous message exchange, which makes it difficult to negotiate the activities. Discussions are lengthy, occasionally spanning several days, and participants are not present all the time. Consequently, all participants are not aware of the decisions taken during the discussion, not even the initiator. Since the message board is public, much confusion is also caused by the different interests and situated practices among the participants.

Thus, the biker community has embraced the web. But there is room for improvement of this new technology. The web is only available in stationary settings, and not in the extremely mobile situations of traffic encounters. A stronger linkage between the Internet and the interaction on the road network could lead to improved interaction, i.e. more enjoying biking. This linkage should not focus on providing wireless connectivity to the web anytime and anywhere. It should rather somehow exploit the benefit of the mobile activities [5], i.e. the traffic encounters.

5. INFORMING THE DESIGN

Here follows the main points to be taken from the ethnographic fieldwork, for the purpose of designing a service for motorcyclists:

- *The enjoyment of driving* – The motorcyclist drive their bikes to enjoy themselves. Consequently, the service should augment the experience of driving or get them to drive even more, rather than rationalizing their movement in order to decrease travel time. The services should also be used unsupervised, with the device tucked away in a pocket during driving.
- *Expressing identity and community membership* – By modifying their bikes and wearing special equipment, the bikers express identity and belonging to a group. Hence, we believe that biking would be more rewarding if there was better means of acquiring knowledge about other bikers, and to express identity.
- *Traffic encounters* – Considering the bikers appreciation in traffic encounters, we believe that motorcycling would be even more fun if moments of visual interaction between fast moving bikers were enriched.

- *Handling traffic encounters in retrospect* – The bikers discuss issues of identification on the public message-board. Still much confusion regarding the details exists. Hence, the bikers would benefit from improved means for relating to earlier events.
- *Arrangements to increase social interaction* – To increase the likeliness to meet other bikers out on the roads, they organize their driving in different ways. They meet at certain places or travel together for a joint ride. Nevertheless, these moments of social interaction could be benefited from to spark future social interaction.
- *Planning a joint ride* – Motorcycling would be more fun of the likeliness of social interaction increased. To approach this bikers organize joint rides by the use of a public message board. We believe it would be easier and more interesting to set up physical meetings if the people invited to negotiate joint biking where selected among those that had a history of previous encounters.

In the light of these summarized findings from the fieldwork, there are several conceivable alternatives for design of a support for motorcyclists. Our interpretation of the empirical data has lead to the design of the Hocman Prototype.

6. THE HOCMAN PROTOTYPE

The Hocman prototype (Fig. 4) is a service designed to extend social interaction in biking (a detailed description, which includes a technical evaluation, can be found in [9]). It is an application for handheld mobile devices equipped with wireless ad hoc networking interfaces. It uses a peer-to-peer architecture to accomplish sharing of HTML documents with peers in the immediate proximity during brief encounters.

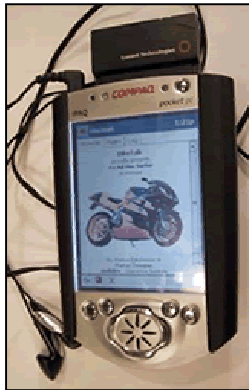


Fig. 4. The Hocman prototype.

The prototype is implemented in C/C++ interfacing the PocketPC system API. We completed the prototype for two sets of devices: Compaq Ipaq 3660, equipped with a Lucent Orinoco WLAN card; and Symbol PPT 2700 with a built-in Spectrum24 WLAN card. In order to enable ad hoc

communication the network cards are configured to communicate in IEEE 802.11 IBSS mode.

The following scenario introduces the use of Hocman. According to how the users express themselves on the message board, they will have the possibility to author personal HTML-pages to be uploaded to their personal Hocman unit. These could contain information concerning modifications on their bike or contact information, such as their nickname on the message board. Before heading out on the roads, they activate their device and tuck it away in a pocket while driving. Whenever encountering another biker, equipped with a Hocman, he or she would hear a sound icon acknowledging that it has automatically shared HTML-pages with the other biker. Thus, the other biker has received the pages made by him and vice versa. When the biker ends his journey, he can browse the pages he has received. The sound and the information on the pages provide the driver to couple the information to a specific encounter. Further, this information can be used very much like the web today, e.g. to take contact through other prevalent media (mobile phone, or web-chats) to set up future rides with the bikers he or she met or just to enjoy them per se.

There are two main technical matters, which have been considered in order to accomplish sharing between peers in traffic. The first is mutual discovery. Such process must operate timely, since it is often the case that users only stay co-located for short periods of time. We have developed an algorithm, called *rapid mutual peer discovery* [9], which accomplish this. The second is transferring data between peers. We use a limited implementation of the HTTP protocol to enable data transfers. Also, the architecture supports two modes: *cruise mode* and *browse mode*. Cruise mode is an automatic downloading and logging facility intended for situations when the motorcyclist focuses on driving. Browse mode is a manual HTML browser for other occasions.

HTML is a flexible format that may contain various media formats other than tagged text, such as embedded audio clips, and images. By letting the user to be in control of the authoring, he or she is in control of both content and format, which allows the service to mediate a personal expression accurately among semi-anonymous users. To encompass flexible descriptions, users are identified by the content of the title tag of his or her index page.

7. INITIAL USER FEEDBACK

As mentioned, we performed field trials [10] where bikers tested the prototype during a limited period of time (for more details on the results, see [10]). We wanted to learn about the users' experience, and to get indications whether the prototype was built on the correct assumptions, i.e. that the analysis of the fieldwork was sensible.

The field trial indicated that Hocman was able to add to the *enjoyment of driving*. It was evident that the bikers did not think that using Hocman would overly rationalize biking; however hearing the sound icon, inspecting logs and browsing contact information etc. would add something positive.

The users found it interesting to read the information on the downloaded pages. They also had many suggestions on what data the pages could contain, which acknowledges that Hocman provides ways for bikers to *express identity and community membership*. On the other hand, there was no consensus on the matter of sharing pages with all users or a limited group. However, all agreed that some sort of user defined filtering or sorting mechanism would improve the concept.

Fundamentally, all bikers recognized that the sound icon alerted co-location of other Hocman users i.e. motor bikers. About half of the subjects could also account for where and when it was heard, which indicates that they had plenty of time to react, look around, and let the experience sink in. More importantly, almost all of the bikers enjoyed hearing the sound icon to an extent that was surprising to us. For instance, some bikers changed their driving behaviour, i.e. waving more, or less as what is custom when otherwise passing a biker. The feedback we got on hearing the sound icon indicates that Hocman was able to enrich *traffic encounters*.

Besides remembering where they heard the sound icon, most users were also able to associate a particular log entry to it. They were able to associate the downloaded HTML-pages with each unique encounter. Hence Hocman provided support in *handling traffic encounters in retrospect*. In one case an entry and the associated web page was helpful when recognizing an acquaintance.

Most bikers we interviewed claimed that they took interest in which bikers they ride together with. They found it plausible that they could contact somebody on the premise of reading a page someone shared. Moreover, a few users recognized that Hocman also could be used for a variety of other purposes, such as ads or dating. This tells us that Hocman may be an important part of the *arrangements to increase social interaction*.

Except from discussing the reasons for contacting somebody, the bikers commented on how this possibly could take place. For example, one biker found it appropriate to supply an URL or email address. He thought that following up a joint meeting through postings to web chats or sending email messages would be an unaffected way of approaching somebody. On the other hand, another user did not think he would contact somebody on the basis of having a persons' page only. However, it seemed like the prototype supported the possibilities for further contact, for example when *planning a joint ride*.

Finally, we are confident that Hocman meets the requirement of being used during driving, however some details could be improved. Lowering the volume of the sound icon playback, a less bulky device, and more comfortable ear-phones perhaps integrated with the helmets, would have been better appreciated.

8. CONCLUSION

Mobile interaction includes experiences of very brief meetings between motorcyclists on the road. Here, they share some of the enjoyment with the urban flâneur, who strolls the pavements of the modern city to cherish the richness of unpredictable occurrences. Our fieldwork reveals the importance to account for highly transient forms of mobile social interaction, in order to understand motorcycling as a social phenomenon. Bikers appreciate traffic encounters, which is observable in the way they wave to each other and in the engagement on the web. But the highly transient meetings provide them only with a glimpse of the identity of the other as well as the activity that goes on. This provides for the urge to fill in on the encounter. Further, the chances for social interaction with unacquainted bikers are rather low since the roads constitute such a vast public place. They attempt to organize their driving to increase the likeliness of meetings on the road. The other forms of social interaction have different strengths and weaknesses in terms of providing for richness in traffic encounters and driving experience.

New information technologies based on handheld computers and ad-hoc peer-to-peer networks fit with current practice since it will provide mobile services at the situation of the encounters. With Hocman we attempt to introduce a tool to support social interaction among bikers. The purpose is to extend the individual encounters, as well as increase the likeliness of them. It will integrate the extremely mobile activities on the road with the stationary activities on the computer.

Several of the related projects are similar to Hocman in their proposal of devices and software applications to support collaborative activities. However, the motorcycling activities we explore take place in an extreme setting, where the mobility by far exceeds what has been reported in earlier work. The specific features of traffic encounters are overlooked and consequently their approaches are not successful in adding value to them.

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10. REFERENCES

- [1] Bauman, Z. (1994). Desert spectacular. K. Tester (ed.) *The Flâneur*. Routledge, London.
- [2] Borovoy, R. Martin F. Vemuri, S. Resnick M. Silverman, B. and Hancock, C. (1998). MemeTags and Community Mirrors: Moving from Conferences to Collaboration. In *Proceedings of CSCW'98*, ACM Press. Pages 159-168.
- [3] Borovoy, R. Martin, F. Resnick, M. and Silverman, B. (1998). GroupWear: Nametags that Tell about Relationships. In *Proceedings of CHI'98*, ACM Press. Pages 329-330.
- [4] Brown, B. and Chalmers, M. (2003). Tourism and Mobile Technology. To appear in *Proceedings of ECSCW'03*, Kluwer Academic Press.
- [5] Chincholle, D., Goldstein, M., Nyberg, M. and Eriksson, M. (2002). Lost or Found? A Usability Evaluation of a Mobile Navigation and Location-Based Service. In *Proceedings of the 4th International Symposium, Mobile HCI 2002*, Pisa Italy. Pages 211-224.
- [6] Cool, C., Fish R.S., Kraut, R.E and Lowery, C.M. (1992). Iterative Design of Video Communication Systems. In *Proceedings of CSCW'92*, ACM Press. Pages 25-32.
- [7] Curtis, P. (1996). Mudding: Social phenomena in text-based virtual realities. In M. Stefik, *Internet Dreams: Archetypes, Myths and Metaphors*. Cambridge, MIT Press.
- [8] Dahlbom, B. and Ljungberg, F. (1999). Mobile Informatics. In *Scandinavian Journal of Information Systems*, Vol. 10, No. 1&2.
- [9] Esbjörnsson, M., Juhlin, O. and Östergren, M. (2002). The Hocman Prototype – Fast Motor Bikers and Ad Hoc Networking. In *Proceedings of 1st Conference on Mobile and Ubiquitous Multimedia*, Oulo, Finland. Pages 91-98.
- [10] Esbjörnsson, M., Juhlin, O. and Östergren, M. (2003). Motorcyclists using Hocman – Field trials on mobile interaction. To appear in *Proceedings of MobileHCI*, Springer Verlag.
- [11] Fällman, D. (2003). Design-Oriented Human-Computer Interaction. In *Proceedings of CHI'03*, ACM Press. Pages 225-232.
- [12] Grinter, R. E. and Palen, L. (2002). Instant Messaging in Teen Life. In *Proceedings of CSCW'02*, ACM Press. Pages 21-30.
- [13] Holmquist, L.E. Falk, J. and Wigström, J. (1999). Supporting Group Collaboration with Inter-Personal Awareness Devices. In *Journal of Personal Technologies*, 3 (1-2). Pages 13-21, Springer Verlag.
- [14] Hughes, J., King, V. Rodden, T. and Andersen, H. (1994). Moving out from the control room: Ethnography in system design. In *Proceedings of CSCW'94*, ACM Press. Pages 123-141.
- [15] Hughes, J., Randall, D., and Shapiro, D. (1992). Faltering from ethnography to design; In *Proceedings of CSCW'92*, ACM Press. Pages 115 – 122.
- [16] Jordan, P. W. (2000). *Designing Pleasurable Products – An Introduction To The New Human Factors*. Taylor & Francis, London.
- [17] Koch, M. and Wörndl, W. (2001). Community Support and Identity Management. In *Proceedings of ECSCW'01*, Kluwer Academic Press. Pages 317-338.
- [18] Kortuem, G. Segall, Z. Thaddeus, G. and Cowan, T. (1999). Close Encounters: Supporting Mobile Cooperation Through Interchange of User Profiles. In *Proceedings of HUC'99*, Karlsruhe, Germany.
- [19] Ljungberg, F., Dahlbom, B., Fagrell, H. Bergqvist, M. and Ljungstrand, P. (1998). Innovation of New IT Use: Combining Approaches and Perspectives in R&D Projects. In *Proceedings of PDC '98*. Palo Alto, CA, USA, CPSR.
- [20] McDonald-Walker, S. (2000). *Bikers – Culture, Politics and Power*. Berg, Oxford.
- [21] Millen, D. R. and Patterson, J. F. (2002). Stimulating Social Engagement in a Community Network. In *Proceedings of CSCW'02*. ACM Press, pages 306-313.
- [22] Rheingold, H. (1993). *The virtual community: Homesteading on the electronic frontier*. Reading: Addison-Wesley.
- [23] Stone, A. R. (1991). Will the real body please stand up? Boundary stories about virtual cultures. In M. Benedikt (ed.) *Cyberspace: First steps*. Cambridge: MIT Press.
- [24] Whittaker, S., Terveen, L., Hill, W. and Cherny, L. (1998). The dynamics of mass interaction. In *Proceedings of CSCW'98*. ACM Press, pages 257-264.
- [25] Weilenmann, A. and Larsson, C. (2001). Local Use and Sharing of Mobile Phones, in B. Brown, N. Green, and R. Harper (eds.) *Wireless World: Social and Interactional Aspects of the Mobile Age*. Godalming and Heidelberg: Springer-Verlag. Pages 99-115.
- [26] Wiberg, M. (2001). *In between Mobile Meetings: Exploring seamless ongoing interaction support for mobile CSCW*. (Ph. D. thesis), Umeå University, Dept. of Informatics, Sweden.