

Bursting the Mobile Bubble

Sus Lundgren and Olof Torgersson

Dept of Applied IT, Chalmers University of Technology|University of Gothenburg
sus.lundgren@chalmers.se, oloft@chalmers.se

Abstract. *Bursting the Mobile Bubble* is a design program (i.e. design approach) aiming at designing collaborative, co-located experiences using mobile devices. In our research we have chosen to explore this field via games and gameplay design, since games open up the design space and allow for design solutions that may seem unusual at first but soon become mainstream. The issues we have found to be interesting arise from combining several connected devices: the division of private vs. public information and interaction; how to design for a co-located awareness, and how to support the design for connected devices.

Introduction

The scene is not uncommon – a group of people hanging out together, each one absorbed by an interaction with their own mobile device, enclosed in the mobile bubble. Mostly, the participants are engaged in activities that estrange them from the group, e.g. checking e-mail or updating Facebook or chatting with someone else. To help open up the design space around this and similar situations we have formulated the design program *Bursting the Mobile Bubble*. Its aim is to make design interventions that investigate how apps for mobile devices can make people interact directly in co-located space instead of enclosing themselves with their own digital device. One of the research areas within the design program is games on mobile devices, which will be the focus of the present paper.

Our reason for choosing games as a means of exploration is that they open up the design space. As argued by Lundgren (2008) designing games and gameplay is a means to “explore new problems and possibilities, and to work with a set of

aesthetics that is freer — and more demanding.” Our work has its foundation in the idea of hybrid games, i.e. enhancement of for instance board games. Already in 2004, Magerkurth et al argued for developing these types of hybrid games, by augmenting the virtual domain with physical and social elements, exemplifying with board games played on interactive tables. Similarly, Benford et al (2005) discussed the challenges related to designing pervasive hybrid games, i.e. games that can be played anytime, anywhere, stating that “A new generation of entertainment technology takes computer games to the streets—and ultimately beyond” (Benford et al 2005, p. 1). The design issues related to intertwining a mobile game with everyday activities was further discussed by Bell et al (2006).

The potential use of hybrid games has also been discussed. Flanagan (2007) reviewed a large collection of hybrid games, exploring how “locative media”, i.e. computer-supported experiences (often supported by mobile technologies) also involving physicality and location, concluding that these types of experiences could utilize empowerment, community building, and cultural change. Similarly, de Souza e Silva and Delacruz (2006) explored the use of hybrid reality games for educational purposes. Their work was followed up by Avouris and Yiannoutsou (2012) who studied mobile location-based games for learning and concluded that the social and collaborative aspect of these games helped in teaching skills like interpretation, acceptance of diverse perspectives, team work, information management, problem solving etc. In another area, Goolsby (2010) discusses combinations of mobile devices and web services as a means of crisis management; another form of hybrid technology.

What differs in these papers over the years is only the shift in technology. From home-built gear and custom made hardware to games played on mobile devices complete with GPS-tracking, accelerometers, and lots and lots of input facilities; text, voice, images, movies etc. This richness in in- and output facilities is in itself a great motivator for working with mobile devices, trying to design novel applications. Another aspect is that, to our surprise, and despite the rich mobile technology and the plethora of apps we have today, very few apps are designed for co-located collaboration.

In our paper we will describe some of the designs we’ve created, or supervised, and lastly we’ll discuss the design implications these cases open up for.

Design examples

SETTLERS OF CATAN goes digital

In this master thesis Joakim Ekendal and Viktor Ingemansson made a digital version of the well-known board game SETTLERS OF CATAN. This game,

designed by Teuber in 1995 features four players building houses on an island having various types of nature yielding various types of resources (in the form of cards) that settlers can harvest, trade and turn into houses, roads and cities on the board. In Joakim's and Viktor's version, the game was played on smart phones and a tablet. The tablet depicted the game board, whereas each player had his or her own hand, i.e. the resource cards, depicted in a smart phone. The project featured two interesting aspects. Firstly, how to design the interaction and UI-design dealing with the transition of objects from the phone to the game board – in the end the metaphor of a teleporter was used. Secondly, how the now digitalized game could feature *new game mechanics*, brought by the compute augmentations, such as spying on other players' hands without them noticing, or weather-effects, both of which were implemented and tried out.

2021

2021 is a tablet game on sustainable city development, developed by author Sus Lundgren and Martin Hjulström. It was tested with 300 pupils aged 12-16 years playing the game in groups of 2-5 people. In this SimCity-like game, players managed a version of their own city, starting in 1970, building houses, work places, schools and recreation etc. in turns of five years. As it turned out, teams played the game in very different paces. Thus, a feature in this game was the teacher tablet where the teacher could see how each team was progressing. The initial idea was also that the teacher should be able to see their actual screen, but this was never implemented.

MonstroCity

In a workshop run by author Sus Lundgren, the game MONSTROCITY was invented by Anders Mårtensson, Anders Qvist and Leif Ryd, and later Sus turned this into a candidate thesis which she supervised.

MONSTROCITY is a pervasive phone game where the whole point is that players need to collaborate by coming to the same place. Players can play it anytime; e.g. on their way home from work or school. Basically, the game resides in an overlay dimension to the everyday world, featuring treasures guarded by monsters of different strengths having different habits. The stronger the monster the more players it takes to scare or kill it. Thus, players currently playing need to form temporary teams which can either scare a monster by walking up to it, or kill it by surrounding it.

The project featured two important design decisions (which are by no means perfect); overall how to play the game without having to stare onto the screen all the time, and secondly how to find and contact nearby players. The candidate thesis touched upon these issues, but focused more on actual implementation.

Quiz Games

In QUIZ GAME, developed by students Sergio Batista and Daniel Ivan, (supervised by author Olof Torgersson), the popular quiz game genre is adapted to co-located use by two players that play against each other; the players' devices are paired using Bluetooth. As the game proceeds the players can see the other player's progress. This adds an element of stress and extra excitement to the otherwise well-explored area of quiz games usually designed around a remote server and played asynchronously.

In QUIZMO, created by students Dan Ludvigsson and Philip Wallin another variation on the quiz genre is explored. Here, players instead create their own quizzes and share them with co-located players.

Discussion

Looking at these design examples we can find that all of our examples build on connected devices, however different types of connections and use raise different questions.

Public vs private interaction and data

The combination of tablets as a public data and interaction space, and phones as a corresponding private space, is a promising concept that indeed requires further exploration in other contexts than games. In any case, the design question lies in the issue of what is to be handled on the phone, and what is to be handled on the tablet.

There are very few commercial applications to look at here; one is IBRAINSTORM where users write PostIts on their phones and with a flick send them to the tablet the phone has been connected to. The tablet provides additional functionality for organizing and editing PostIts. (One can also create PostIts on the tablet, which means that, strictly speaking, the phone is not needed.) Another is SCRABBLE where the tablet holds the board and smart phones hold individual players' tiles. In academia we find MobiComics (Lucero et al 2012) which features a comic, co-created on separate phones, displayed on a public display.

In the case of our version of SETTLERS OF CATAN, SCRABBLE or any card game and many board games that one wants to transfer to a tablet-phone environment, the division is fairly natural; players "hands" (private information) go onto the phones, and the tablet is the game board (public information). But for collaborative applications of other kinds, these borders need to be explored. In the IBRAINSTORM case, one could imagine that the tablet was merely for combining different content types, and that the phones could have several different GUIs/apps; one for writing PostIts, one for making line drawings (with a set of

relevant tools); one for creating and editing tablets and diagrams – thus the different smart phones connected could provide different tool sets.

In 2021, we saw how the teacher’s tablet could provide both overviews and detailed views on what happened on each tablet – this is another take on private and public where perhaps data and GUIs are public but interaction is coupled to the private device. What comes to mind here are ad-hoc and on-the-spot crisis management; the tablets communicated via Bluetooth so an internet connection was not necessary. Less serious application areas would be any kind of collaborative problem solving where several task teams are working together on a larger task. Here, questions that arise are related to firstly how and if this ambient awareness of other group’s activities should be enabled, and secondly, how much interaction “power” the leader should have via the master tablet.

On-the-move connections

We see an interesting future for on-the-move collaboration, meaning out on the streets, walking or moving, rather than sitting comfortably on a train. This is by no means a new idea; there have been many location-based games and hybrid games exploring this, as collected by Flanagan (2007) and Avouris and Yiannoutsou (2012).

Design questions related to this are how to design a sense of awareness without focusing on the screen, but on the environment instead; Hassenzähl et al (2012) have touched upon some interesting idea here. Current ideas regarding the design of MONSTROCITY is to use mostly sound and speech. This solution has several benefits: players can focus on their environment instead of the screen, which is especially useful or even necessary outdoors. Second, it opens up for interaction in public places – there is nothing strange with a person walking around and talking for themselves, i.e. with the phone, nowadays.

Co-Locatedness as core

What it all boils down to is of course the deliberate design that demands collaboration between several mobile devices that are co-located, or can be. Here, the quiz game examples illustrate a form of exploration of pure co-locatedness. In these games the fact that the participants are actually in the same place is taken seriously and is used as a starting point for the game design. As shown in our version of *SETTLERS OF CATAN*, the digitally mediated co-located game opens up for the use of new and different activities such as spying, or the game holding information the players do not have, like variable costs etc. However, focusing the design towards co-located collaboration can of course be used in other types of applications as well. For instance, bot Clawson et al (2008) and Lucero et al (2011) developed a photo-sharing application where users need to be together to share and explore each others’ photo collection in a manner very different from

all the prevalent existing social media apps for sharing photos. The question is of course how to find a methodology which supports the ideation of this type of apps, as well as the development and testing of them – which is luckily the goal of this workshop.

Conclusion

Given our design examples of several co-located collaborative mobile games, we see several interesting research challenges; the division of private vs. public information and interaction; how to design for a co-located awareness, and how to support the design for connected devices.

References

- Avouris, N. and Yiannoutsou, N. (2012): *A review of mobile location-based games for learning across physical and virtual spaces*. Journal of Universal Computer Science, vol 18.(15), pp. 2120-2142.
- Bell, M. et al (2006) *Interweaving mobile games with everyday life*, Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI 2006), pp 417-426. ACM Press.
- Benford, S., Magerkurth C. and Ljungstrand, P. (2005) *Bridging the PHYSICAL AND DIGITAL in Pervasive Gaming*. Communications of the ACM, March 2005/Vol. 48, No. 3, pp. 54-57.
- Flanagan, M. (2007) *Locating Play and Politics: Real World Games and Political Action*. Proceedings of the Digital Arts and Culture Conference, Perth Australia, Dec 2007.
- Clawson, J., Volda, A., Patel, N. and Lyons, K. (2008) *Mobiphos: A Collocated-Synchronous Mobile Photo Sharing Application*. Proceedings of the 10th international conference on Human computer interaction with mobile devices and services (MobileHCI '08), ACM Press.
- Goolsby, R. (2010): *Social media as crisis platform: The future of community maps/crisis maps*, ACM Transactions on Intelligent Systems and Technology (TIST) archive, Volume 1 Issue 1, October 2010, Article No. 7
- Hassenzahl, M. et al (2012) *All You Need is Love: Current Strategies of Mediating Intimate Relationships through Technology*. Transactions on Computer-Human Interaction (TOCHI) , Volume 19 Issue 4, ACM Press.
- Lucero, A., Holopainen, J. and Jokela, T. (2011) *Pass-Them-Around: Collaborative Use of Mobile Phones for Photo Sharing*, Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI 2011), ACM Press.
- Lucero, A., Holopainen, J. and Jokela, T. (2012) *MobiComics: collaborative use of mobile phones and large displays for public expression*, Proceedings of the 14th international conference on Human-computer interaction with mobile devices and services (MobileHCI '12), ACM Press.
- Lundgren, S. (2008) *Designing Games: Why and How*. interactions, Volume 15 Issue 6, November + December 2008, pp. 6-12, ACM Press.
- Magerkurth, C., Engelke, T. and Memisoglu, M. (2004): *Augmenting the virtual domain with physical and social elements: Towards a paradigm shift in computer entertainment technology*. ACM Computers in Entertainment, 2(4):12.
- de Souza e Silva, A. and Delacruz, G. C. (2006) *Hybrid Reality Games Reframed, Potential Uses in Educational Contexts*, Games and Culture, Volume 1, Number 3, July 2006, pp. 231-251.