

Interaction Design for “Digital Djurpark”

Karin Fahlquist

Digital Media Lab (DML)

Dept of Applied Physics and Electronics
Umeå University, SE-901 87 Umeå, Sweden
karin.fahlquist@tfe.umu.se

Abstract

In this paper the possible interactions in a concept as “Digital Djurpark” are defined and discussed. The “Digital Djurpark” is based on a wireless sensor network containing of 100 sensors inside a zoo. With these sensors it will become possible to collect all kinds of different data and to present it to the visitor in a new way to give her a whole new experience of her visit to the zoo. The definition of the visitor, the park and the animals are enlarged to contain more than just the physical “object” but also all kinds of information that could be connected to it. This means that the interaction between them will become something new and even greater than today.

1. Introduction

The Swedish zoo “Lycksele Djurpark” is the northernmost zoo in the country. They are specialized in Nordic animals and have animals like the bear, elk, musk-ox and wild boar to mention some. It has become one of the biggest tourist attractions in northern Sweden [1]. Even though the animals are outdoors the whole year the zoo has difficulty to attract visitors to the park during the winter. Their opening season is for that reason from the end of May to the end of September and with some occasional openings around holidays like Christmas and Easter it is closed for the rest of the year. Even though the zoo is closed the animals’ life continues as usual, they are outside during the winter since this is their natural environment. It is even so that some of the animals that are hard to see during the summer are easier to see during the winter, for example the lynx.

The project “Digital Djurpark” (partly funded by the EU commission) wants to bring the digital era into the zoo-world. By doing that a place like Lycksele Djurpark could be able to attract visitors the whole year and give them something new. The idea is to give the visitor of the zoo a “new experience” and the way this shall be done is with a wireless sensor network. The network will consist of 100 wireless sensors that

are able to configure themselves to a network. As an example the sensors could be collecting data as video, pictures, sound, and temperature. The plan is to mount sensors on some of the animals too. Then the sensors can collect the same kind of data as fixed sensors but also data as movement and heartbeat.

All of these data could both be presented in some kind of application that the visitor could approach at home but also in an application that the user could approach inside the park.

2. Interaction for “Digital Djurpark”

The interaction in a traditionally zoo is very passive. You walk around in the zoo and you might be able to pet an animal. When making the zoo digital the goal is to expand and enhance the experience by giving the visitor more interactions with the different parts of the environment. One of the challenges of this project is how to present all the data that could be collected.

The general interaction in an environment as the zoo consists of three interactors: two agents and one artefactual object (figure 1). The two agents are the visitor and the animal. The artefactual object is the physical park. There is interaction between all these three parts, even interaction within themselves as it can be more than one sample of each interactor.

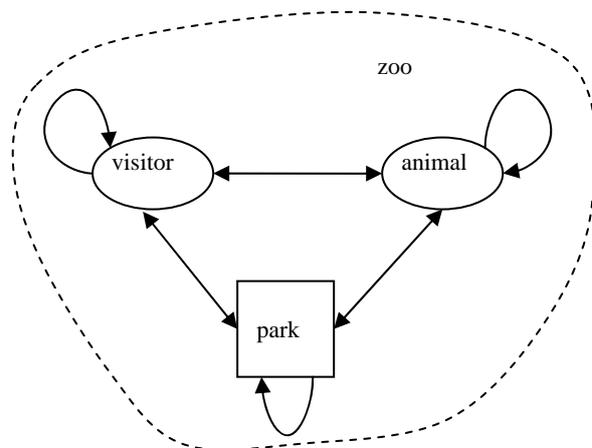


Figure 1. Interactions in a zoo.

Map of interaction should be as figure 2 for the new improved experience for the visitor in the zoo. Here the primary interactor is the visitor and the interaction is observed from the visitor point of view.

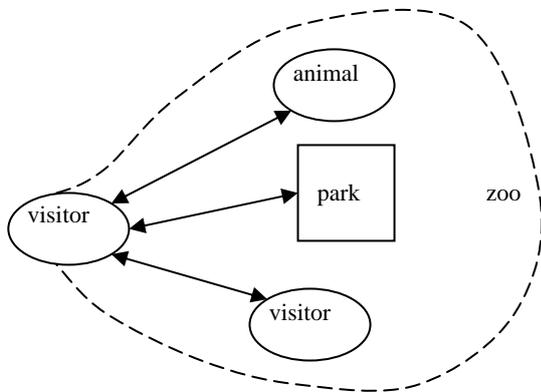


Figure 2. Interaction for improved experience.

The definition of the zoo will become larger than it is today. With the sensor network the zoo will become a combination of a physical place in Lycksele and some kind of place in the digital world together with all the information and actors that can be connected with it. Let's go through the different interactors inside the zoo and see what they consist of.

By the animal we now mean not just the physical animal in itself but also all the information connected to it:

- Basic facts about the species (e.g. text)
- Pictures of the animal
- Video sequence with the animal
- Live stream video of the animal
- Sound collected from the animal

A visitor will become both the

- physical person inside the Lycksele Djurpark
- Someone who will be able to be anywhere in the world where there is an internet connection.
- Interactive information about and from the visitor in text, video, pictures and so on

The park will in this scenario be

- Lycksele Djurpark
- Some web application on the internet
- An application for a handheld artefact
- Dynamic and static information connected to the above places

The focus is now on the interaction that the visitor has with the three other interactors. The "visitor – animal" interaction could become something more personal, the visitor could get a closer relation to the

animal than it has today in a traditional zoo. Information to the visitor will not just be in plain text but it could also become information as sound and live video so the visitor could follow the animal during its day. The visitor can decide when to get the information and in what form. It should also be possible to give the visitor the ability to interact with the information given so that she both can contribute with her own information and influence events in the zoo. All this has to be done in a way that is appealing to the visitor giving her the feeling that she is part of the zoo and that she is able to affect the information and the interactions. The interactions with the animals can both be at home and at Lycksele Djurpark. A handheld artefact at Lycksele Djurpark could give the visitor possibility to interact with animals both that they see and with animals that are out of sight.

The interaction "visitor – park" will give the visitor new ways of coming in contact with Lycksele Djurpark and the information connecting to it. What if she could tumble upon it without knowing about its existence before? What if the visitor was looking around at a web-based map application and from that application somehow got information of the existence of the zoo. Here the information could be anything from sound to moving pictures, something that got the visitors attention and could get her curious. The visitor could simply "enter" by click its way into the zoo through the web-based map application. She could then decide what part of the zoo she wanted to get to know more about and put her self in that spot of the park.

When the visitor is at Lycksele Djurpark the interaction "visitor – park" could give her both static and dynamic information that at the same time could be mobile or ubiquitous [2]. She would not only be able to get answers to her traditional question like

- "where the toilet s are"
- "what time the animals are being feed"
- "where to find a cafeteria"

but also get information from the particularly place she is at right now and get information from

- something that has just happened there
- who has been there
- what might will happen soon.

This also means that the visitor herself will be able to give this information to the park so other visitors can get hold of it. All the interactive information would be provided through to a digital handheld artefact which she uses inside Lycksele Djurpark. Here it is important to think about using cognition in a way so that the visitor feels that this is something that is easy and appealing to use [3].

The interaction for the visitor at Lycksele Djurpark could both contain mobility and ubiquities possibilities. The handheld digital artefact could both get information that it has all the time but also specific

information that it gets depending on the location it is at.

3. A Case Study

Lycksele Djurpark has had a webcam inside the bear hibernation the last couple of years and a live stream has been displayed on a big screen inside one of the cafeterias inside the zoo. In December 2008, the two local newspapers started to show the webcam on their web pages, Västerbottens Kuriren, <http://www.vk.se/>, and Västerbottens Folkblad, <http://www.folkbladet.nu/>. The pictures shown at these web addresses where not live streamed video, it was pictures that was updated every thired second. This event was really something that was outside the Digital Djurpark project but we saw it as something that we could look into and see if we could improve.

The comments at the newspapers webpage from the readers showed a dissatisfaction of the application:

- Blurry picture. (www.folkbladet.nu 2008-12-23 21:31)
- It would be fun to follow the bears in the hibernation! But is the web camera really working? Or is something wrong with my computer? (www.vk.se 2009-01-08 12:43)
- Have been looking now and then, you could see movements even if they are small. (www.vk.se 2009-01-20 20:22)

We had some idea how to improve the existing picture on the web and what to add so the readers would get a better experience of the application:

- Make the picture clearer
- Make the greyscale picture into colour
- Add sound to the video
- Let the visitor interact with the picture (zoom, turn, etc.)
- Show sequences from the last 24 hours

The picture on the web was very dark and therefore very hard to se what is was suppose to represent. By making the picture clearer it would be easier for the reader to understand the picture. Even though it is more correct to show a greyscale picture from a dark hibernation the colour would be more appealing to look at. It would be easer to recognise the different parts of the picture and what they are. To add sound would give the visitor a new dimension to experience the animal. It will be a step toward the feeling of being there with the bear. The possibility to be able to interact with the picture itself will also give some sense of being at the same place as the bear. It could be compared with walking toward and around the bear. By being able to see sequences of the bear's movements for the last 24 hours will give the visitor the feeling of being able to follow the life of the bear.

All these changes will increase the experience for the visitor compared to how it is presented today.

To make the picture clearer we could increase the contrast in the pictures with histogram equalization and also take away some of the noise by filtering it with median filter.

When it comes to putting colour into the picture we realized that we had a problem because when greyscale and colour has the relationship "one to many". We made a test on this particular picture and could establish that this was true for this picture. The test was made using Photoshop and some referents pictures with the three colours. The referents picture was used to decide what colour to use in the images. By turning the reference pictures into greyscale we could get a translation table between the colours and the greyscale. When we then applied one colour to the picture we saw that the wrong areas got coloured.



Figure 3. The picture from the web camera.



Figure 4. Contrast increased and filtered with median filter

To colour the picture in a good way we need to separate the three areas (hay, bear and wall) that the

picture consist of before colouring it. The idea is to use Hidden Marov Model to both separate the areas and at the same time colour it. We have identified that the pictures consisting of three areas so with some training with colour pictures we would be able to get a model that we can use.

When we have done the improvements on the picture we could then make a Flash application that could show the pictures for the visitor. By making the Flash application we could add sound and the other interactions in an appealing way that would give the visitor a better experience. By detecting movements in the pictures during 24 hours we could make video sequences that would be of interest for the visitor. With the Flash application the visitor could then decide by herself when to see these.

4. Conclusion

With cameras all over Lycksele Djurpark we don't want the feeling of Big Brother, instead we want to give the visitor a way to interact with the zoo. Our goal is to make Lycksele Djurpark with its wireless sensor network something much greater. We want the sensors to be not just cameras but also other types of sensors that together will give the visitor of the zoo a new improved and exiting experience. We think that with the right interaction and presentation this could go beyond Big Brother and give the visitor a new type of experience.

5. References

- [1] <http://www.lyckseledjurpark.com>, 2009 February
- [2] Lars-Erik Janlert, "The Evasive Interface – The Changing Concept of Interface and the Varying Role of Symbols in Human-Computer Interaction", J. Jacko (Ed.): Human-computer Interaction, Part I HCII 2007, LNCS 4550, pp 117-126, 2007, Springer-Verlag Berlin Heidelberg 2007
- [3] Donald A. Norman, "Cognitive artifacts" in John M. Carroll (red.), Designing interaction, Cambridge University Press, Cambridge, 1991