

# Generating meaning through interaction in a refreshing interactive water installation for children

Narcís Parés, Anna Carreras, Jaume Durany

Audiovisual Institute, Universitat Pompeu Fabra (UPF), Barcelona, Spain

Telephone: +34 93 542 2631, Fax: +34 93 542 2202

E-mail: npares@iua.upf.es

## ABSTRACT

This paper presents the steps followed in the conceptual design and interaction design of an interactive water installation for children to provide the game with some significance generating meaning through interaction itself.

## Keywords

Interactive Communication, Meaning, Real Time Interaction-driven Design, Attractions, Children.

## GAME DESIGN

Interactivity has been widely applied in the world of sheer entertainment for children, especially in computer games, but also in large scale installations or even in theme parks[1][2]. In such applications, interaction is basically experiential [4].

We present a large scale entertaining interactive installation for children. Here, interactivity and a game are designed in a natural and non invasive manner, to exploit some advantages of interactivity and its properties as a medium, to communicate meaning and concepts by experiencing them, rather than as a mere access to information. Water Games was an open air interactive installation specially conceived for the Universal Forum of Cultures Barcelona 2004. The installation was designed to transmit some ideas related to the three main axes of the Forum of Cultures: respect towards cultural and ethnical diversity, conditions for peace and sustainability.

## Playing around the world: the rings

Water Games had to be specially designed for children from around the world because of the international dimension of the event. The game of forming rings was chosen as the way to play in Water Games because it is an extremely well known game to all cultures. Moreover a natural interaction would be obtained, because children would be asked to do something they already knew. This should influence the naturalness of interaction and minimize the learning curve enhancing throughput of

users.

## Advantages of the mechanics of forming rings

Indeed, the game mechanics presents some interesting properties:

- By having to find enough people to form a ring, socialization is promoted among the participants.
- A ring of people is inherently multiuser and a non hierarchical structure. All the participants in the ring have the same level of importance.
- Having to hold hands with others implies a respect to others, a respect to diversity.

## Interaction design

The formation and spinning of the ring was designed to be the interaction mechanism to activate Water Games. So a water fountain was placed at the center of the ring and sequences of jets of water were activated while, and only as long as, the ring remained completely closed and in motion. See Figure 1.



Figure 1: Visitors interacting with the Water Games.

To avoid a chaotic result in the spin participants needed to agree on the spinning direction, which made them work for a common goal. This allegorically represented working for peace. Moreover water was placed at the center of the ring in a prominent position. Therefore, participants could become aware of its importance as a natural resource. Physically, the ring protects the water that hence, symbolically signifies that it is an element that must be looked after. This is posing the issue of a sustainable use of natural resources.

As can be seen, interaction itself was designed to provide more than a simple fun experience. The design approach followed the strategy known as interaction-driven design which starts by defining the way in which the users interact, before defining the final content [3].

*LEAVE BLANK THE LAST 2.5 cm (1") OF THE LEFT COLUMN ON THE FIRST PAGE FOR THE COPYRIGHT NOTICE.*

## FINAL FORMAT OF WATER GAMES

Water Games finally evolved into an installation with a 1200m<sup>2</sup> footprint placed on the Universal Forum of Cultures central plaza [5]. It was composed of a set of 9 circular plazas that were connected by short paths, providing a discovery site as a free roaming promenade formed by a mesh of walkways, see Figure 2.



Figure 2: Water Games installation aerial view.

The interactive game proposed in each plaza, as stated before, was to form a ring around its central fountain, formed by four or more users, and in all cases in motion. When playing, the fountain activated vertical water jets and sounds of children laughing were heard. See Figure 1. To guarantee a robust, non-invasive and natural interaction, an artificial vision system, placed above each fountain was developed and incorporated as the main interface. See Figure 3.



Figure 3: A circular plaza with the fountain and a tubular tripod for the artificial vision system.

At the end of the promenade a large fountain generated a cloud of water that created a refreshing ambience. This large blue circular fountain symbolized our world, around which all activity occurs, see Figure 2. Children's music from around the world played flooding all the installation.

## RESULTS

Water Games was accessible at the Forum of Cultures for 141 consecutive days, from 11am to 12pm. During this time, over 315000 users experienced it. A large percentage of the participants in Water Games were groups of children that went to the Forum as part of their school activities. We have received a lot of feedback from the teachers and careers of these school groups. Many thought that it was the most participative activity within the Forum. This was already very important socially to reflect work for peace and respect for diversity. They found the experience was suitable to transmit some concepts to children who did not easily understand them through exhibitions, theater or performances.

## CONCLUSIONS

Water Games successfully reached several goals related to interactivity in an installation that had important constraints such as being an open air attraction, having to cope with a large user throughput, having to interact with a physical medium as water and having to provide some concepts through experience. Briefly, the goals were:

- **Naturalness:** Achieved by choosing a universal structure, the rings, for the interactive activity.
- **Short learning curve:** Because forming rings is such a well known action users did not need to learn how to play.
- **Multiuser:** the game structure allows large numbers of users, up to 12 per plaza, to play simultaneously.
- **Participative:** the users were required to play in a social participative event where they could comment their experience in real time.
- **Robustness:** The artificial vision system allowed an interaction without elements to be manipulated (no buttons, joysticks, etc.) and therefore it maximized robustness and minimized maintenance.
- **Non-Invasive:** The artificial vision system also provided a non-invasive interaction system where users need not wear any sensors or markers, nor any type of cumbersome element. This made the installation extremely accessible to all sorts of public.
- **Excellent throughput:** Water Games provided a proven throughput of 2000+ users/hour accepting 100 simultaneous users, making it a massive flux experience.

All these goals have been reached with a rich interaction which makes the users live and experience the concepts through children game play.

## REFERENCES

1. Magic Kingdom, Walt Disney World, Orlando. <http://disneyworld.disney.go.com/wdw/index> (last accessed April 2005)
2. Men in Black Alien Attack, Universal Orlando Resort. [http://themeparks.universalstudios.com/orlando/website/usf\\_attraction\\_mib.html](http://themeparks.universalstudios.com/orlando/website/usf_attraction_mib.html) (last accessed April 2005)
3. Parés, N., Parés, R. Interaction-driven virtual reality application design. A particular case: 'El Ball del Fanalet or Lightpools'. *PRESENCE: Teleoperators and Virtual Environments*. (2001). Cambridge, MA: MIT Press, Vol 10.2. 236-245.
4. Roussou, M. Learning by Doing and learning through Play: An exploration of Interactivity in Virtual Environments for Children. *ACM Computers in entertainment* 1,2 (2004) ACM Press.
5. Water Games site: <http://www.iua.upf.es/eic/jocsdaigua> (last accessed April 2005)