

# Sissy: an interactive installation with a personality

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## ABSTRACT

This paper describes the interactive installation Sissy (Sound-driven, Interactive, Self-conscious SYstem) at the STRP festival. The concept adheres to the design philosophy of slow technology and aims at stimulating relaxation. Sissy is made out of 700 flip dots with a black and white side and it responds to visitors' movements sensed by a camera. The white dots are coloured through the projection of animations. When people move too close to Sissy, the white dots flip to black giving the impression Sissy 'disappears'. When people take more distance the white dots, or Sissy, appear again. Observations and interviews show most of Sissy's visitors do not understand the interaction the way it was designed. The competition with other installations at a local art festival, the noise and crowded space reduce the possibilities for interaction. Most interviewees characterize Sissy as being shy, indicating she has some sort of personality, which was intentionally designed.

## Author Keywords

Slow technology, STRP festival, interactive installation, interaction design, embodied interaction.

## ACM Classification Keywords

H.5.2. User Interfaces and H.5.m Miscellaneous.

## INTRODUCTION

It seems that in today's society we are busier, more stressed and we continuously think we run out of time. A design philosophy which fits this situation is 'fast technology', trying to make product design efficient and functional. The opposite is called 'slow technology' that can provide moments of mental rest and reflection (Hallnäs & Redström, 2001). Because it is interesting to see the actual influence of slow technology on the audience, Redström et al. (2000) assume that slow technology suits public spaces, but they did not actually confirm this. Therefore our aim was to implement an interactive installation called Sissy at an art and technology festival, STRP festival.

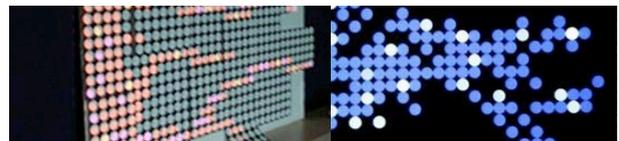
Embodied interaction focuses on the relation between body and interaction, and the body can be human, but can also concern the body of an object. In this paper we try to

combine both. The whole human body interacts with Sissy, but Sissy itself also has a body, or at least wants the audience to think of it as having anthropomorphic features. Together this should create an experience.

## DESIGN OF SISSY

Bolter and Gromala (2003) state that the design, or medium, should explain itself to supply understanding for the user's experience of it. Examples of interactive installations include: Murmur (Rydarowski et al., 2008), Light around the edges (Winkler, 2000) and Hylozoic Grove (Beesley et al., 2010), which show an interaction between an installation and its user in terms of movement. TouchMeDare (Boerdonk et al., 2009) shows an exploratory interaction using touch and sound. Audience (rAndom International, n.d.) confronts the visitor with an interactive installation that observes you instead of you observing the installation. The Bitforms works by Daniel Rozin (n.d.) include a wooden mirror which mirrors the visitors face by a screen made out of wooden pixels. All these installations describe an interaction that asks for an exploratory attitude to find out how the installation responds to its visitors and so does Sissy. The non-interactive installation Cloud (Troika, n.d.) uses a technique that operates with flip dots for creating patterns. These flip dots supplied the inspiration for Sissy's appearance that will be explained in the next section.

Sissy is an interactive installation that responds to noise in its physical environment. The concept was created by Reitsma and Pieters who were inspired by 'slow technology'. The first generation of Sissy was inspired by Cloud's (Troika, n.d.) flip dots. Sissy was created to be used in a hotel lobby and the flip dots, which are coin-shaped elements, can flip from the black side to the white side. When using projections the white side could appear animated (see Fig. 1).



**Figure 1: First generation Sissy: projection on a paper model (left) and screenshot of the animation on a PC (right).**

Sissy responded to noise in the lobby and aimed to help waiting hotel guests forget about time. They could discover that Sissy's behaviour changes: when there are a lot of people in the lobby Sissy detects a lot of noise and disappears, when there is almost no one (or no sound)

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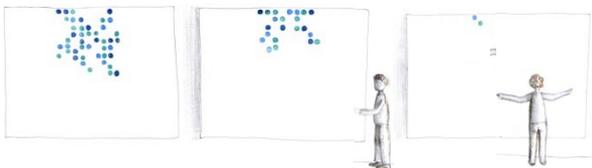
<http://research.it.uts.edu.au/idhup/workshops/workshop-the-body-in-design/>

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Sissy re-appears. This was the idea behind Sissy but it was never implemented as such. The challenge of the project described in this paper was to transform Sissy to suit a new context: the STRP festival that tries to fuse art and technology and to work out the first generation idea into a working demonstrator.

At the festival the audience differed from hotel guests waiting in a lobby and therefore some concept changes needed to be made. One was aiming at creating a reflective activity for festival visitors by sensing the distance between Sissy and the visitor, instead of sensing noise in her environment. Sissy directly responds to the visitor's distance, aiming at drawing attention and instilling curiosity into the interactive installation's behaviour. This curiosity leading to reflection was our interpretation of slow technology. Furthermore, Sissy's shape and location was changed to suit her new behaviour, e.g. she was coming from the top of the screen instead of sideways from the corner of a hotel lobby. Fig. 2 shows the interaction scenario between a visitor and Sissy.



**Figure 2: Interaction scenario with Sissy. Sissy feels comfortable and moves down (left). Sissy senses a visitor and moves up to create greater distance between her and her visitor (middle). Sissy moves up into the left corner because of the visitor's movement to the right (right).**

We decided to make Sissy's 'body' quite large to stand out at a festival, namely 168 cm x 187 cm, and consisting of black (back side) and white (front side) coloured flip dots that can be rotated using magnetism. An algorithm on a connected PC enabled to switch direction of the magnetism for every single coil that belongs to one single dot. The projection's algorithm for the animation ran parallel to the flip dots flipping from black to white. The result is a coloured pattern that represents Sissy's appearance that is created by the projection's reflection on the white flip dots (Fig. 3).



**Figure 3: Close up of Sissy's new appearance on the flip dot board shows the effect of the projection on individual dots.**

We wanted to find out how STRP festival visitors experienced Sissy, in the next section we explain what method we used.

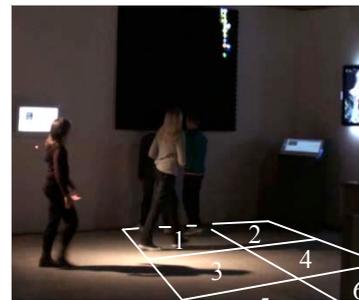
The STRP festival (n.d.) is a yearly happening that aims at fusing art and technology. The focus is on a large target group: artists, die-hard engineers, high school students and even entire families. It took place from November 18th until November 28th 2010 in Eindhoven, the Netherlands. The festival attracted approximately 30,000

visitors that year. Sissy was situated in a 4m x 4m corner of an exhibition space that was part of a café. Because of several works using light effects the space was kept dark, the windows were covered and only few light sources were allowed. People passed by but also could sit down, overlooking the entire space. A camera hanging on the ceiling was programmed to be able to detect visitors' positions in the dark space using infrared lamps. Next to these lamps, hanging around the camera to enlighten the 4m x 4m detection, a projector was attached to the ceiling (Fig. 4).



**Figure 4: Infrared lamps (1), camera (2) and projector (3) hanging on the ceiling above the detection area.**

The infrared lamps were used for motion detection and together with the division of the detection area into a 4m\*4m grid enabled to detect peoples' movements in one of these grid areas and thus determine peoples' positions. The resulting six areas (Fig. 5) corresponded to specific behaviour of Sissy. In general Sissy will try to create a distance between itself and the visitors, e.g. moving to the right when people are on the left (area 1, 3, or 5) and vice versa (area 2, 4, or 6). Sissy will move up, when visitors move closer to her, and the distance determines with which speed. E.g. Sissy moves up quickly when people reach area 1 or 2, and quite slowly when they enter area 5 or 6. Of course the behaviour of Sissy combines moving left or right, up or down, which makes the behaviour appear complex, but still quite natural to the observer. The idea is that the audience will think Sissy is shy.



**Figure 5: Indication of motion detection grid of Sissy.**

After experiencing Sissy for more than one minute, in total 30 visitors were interviewed. The interviewees were mostly Dutch (27 out of 30), their ages differed between 19 and 60 years. The interviews took place near to Sissy to enable the interviewee to observe Sissy during the interview, but not interact with her. The semi structured interviews aimed to give an impression of people's vision and impression of Sissy. The interview contained three open questions and several optional continuation questions. Visitors were asked to give their general impression of Sissy's behaviour and emotion through the following semi-structured interview questions: What is your first impression? Do you think it is interesting? Could you imagine observing Sissy over a longer period

of time? Could you describe Sissy's behaviour? Do you understand her behaviour? Do you recognize a specific character? Do you consider Sissy being shy? What kind of emotion does Sissy gives you? Do you feel different after visiting Sissy compared to before? Can you describe your emotion on a scale with 0 being relaxed and 10 being tense? The interviewer only asked additional questions like: 'why', 'how' and 'what' besides these ten questions during the interview. Using an affinity diagram, the interview was analyzed by means of clustering. For summarizing and abstracting the answers the following method was used. First a 'keyword' selection was made what interviewees mentioned during the interview. In some cases a 'keyword' could also be a small sentence. From these 'keywords' only those words that directly related to the corresponding question were selected. By putting them on post-its the answers became abstract. Categorizing the post-its in terms of affinity an overview of answers was created. This overview (Fig. 6) enabled to compare and to make connections between different clusters.



**Figure 6: Results of interviews, clustered keywords.**

Other information was gathered on all installations by the festival organization in terms of a short digital questionnaire for collecting keywords using the following questions: 1) What is your first impression? 2) What strikes you most in Sissy? 3) What dish, candy or snack does this Sissy taste like? 4) What do you consider to be the most artistic quality of Sissy? 5) What would your mother think of this work? 6) If Sissy would be a city, which city would it be? 7) How does this art work make you feel? 8) What do you find most innovative about Sissy? 9) Which word would you use to tell others about Sissy? 10) Which celebrity does this work remind you of? 11) Which theme does this art work address? 12) What innovation do you feel Sissy strongly presents?

## RESULTS

All the thirty interviewees answered all ten semi-structured interview questions that resulted in 365 keywords. Interviewees were observing Sissy for at least one minute to indicate their interest before they were asked to participate the interview. Seven days of observations showed that the detection area was always occupied by at least one visitor and sometimes there were even ten people positioned in the detection area. The infrared camera recordings also showed that when visitors spent less than one minute of their attention to Sissy, they were usually just passing by and walking towards other installations. We also saw some visitors using their mobile phones to illuminate the dots and see whether this would induce behaviour.

Clustering the keywords of the interview questions about the visitors' general impressions resulted in a large group of keywords that could be summarized as visitors trying to understand the working of Sissy. Keywords included 'how does it work?', 'complex', 'I don't get it', 'flipping because of light?', and 'is it interactive?'. Another big and notable interview cluster can be summarized as 'interesting'. Descriptions of Sissy's character were: 'scared, go away, fear, happy, curious, playful', aware, unpredictable, shy and keep an eye on you. Some interviewees came up with a personification like 'butterfly', 'wind through trees' or 'a small cute animal'. In general interviewees made the assumption that 'the dots flip because of the light'. Visitors mentioned the words 'interesting' and 'fascinating' for reflecting their emotion, but described the environment as 'noisy' and 'crowded'. Nevertheless, the general score for describing their feeling resulted in an average score of 2,5 (scale 0=relaxed, 10=tensed). One interviewee even mentioned the word 'meditating' if the environment would have been more peaceful.

The digital questionnaire provided by the festival was filled out by 307 festival visitors and resulted also in keywords. The most mentioned keywords for describing the visitor's first impression of Sissy were: 'Funny', 'cool' and 'light', 'fascinating' and 'nice'. What affected visitors in Sissy was the keyword 'colour'. The candy types 'liquorice' and 'smarties' were mentioned for describing the taste of Sissy. An artistic quality of Sissy was described by the keywords 'technology' and 'tenderness'. On the question what their mother would think of Sissy visitors answered: 'funny' and 'beautiful'. The cities visitors choose for Sissy were 'New York' and 'Berlin' and 'Eindhoven'. 'Sadness' and 'slow' were keywords for describing visitors' feelings when interacting with Sissy. The most innovative aspect of Sissy was considered to be related to the 'technology'. Visitors would tell others about Sissy in terms of 'unexpected' and 'dynamic'. The celebrities that visitors thought were related to Sissy were 'Salvador Dali' and 'Warhol'. The theme visitors addressed to Sissy was 'light'. The innovation that Sissy strongly represented were described as 'solar energy', 'interaction and feeling'. Clustering all these keywords of the 12 festival questionnaire questions in terms of affinity resulted in the following clusters: 'organic', 'nice', 'light', 'fascinating', 'technology' and 'complex'.

## DISCUSSION

The questions that were used for the digital questionnaire did not enable visitors to explain their rationale behind the keywords and therefore the answers were difficult to interpret. However, the first impression of visitors indicates that Sissy is experienced as being complex, both technical and behavioural. This complexity resulted in curiosity and observations showed people had spent extra time in order to understand it better. We assume that visitors' willingness to spend more time with Sissy would increase even more when Sissy would have been placed in a less distracting environment. The diversity in Sissy's characterizations reflected the diversity of Sissy's

character: visitors experienced both a passive attitude described with 'go away' and an active attitude such as 'curious'. The fact that the greater part of participants scored their feeling as being 'relaxed' in the interviews reflects the goal of slow technology but it is unclear whether visitors experienced relaxation because of Sissy or because of attending the festival in general. Misunderstanding the behaviour by explaining the movement of dots by light movement shows visitors did not notice Sissy responded to their movements. This might have been influenced by other artworks at the festival, since several other works did respond to light and therefore the visitors were expecting similar behaviours of Sissy.

Experimenting with the implementation of 'slow technology' in a public space shows new findings on the relation between context and 'slow technology'. The results raise misunderstanding about the interaction that might possibly be caused by the amount of distraction. This indicates that not every environment matches the design vision of 'slow technology', simply because Sissy's slow technology did not match visitors' expectations. Sissy differed from other installations by not having spectacular interactions and obvious feedback but visitors still expected this.

It was assumed that visitors would understand that they could interact with the installation but the results show otherwise. The corner Sissy was situated in was shared with a shop and another installation resulting in a crowded area around Sissy. It was concluded that there was interference with individual interactions, which resulted in a twisted and incomprehensible interaction for the visitors. Together with the conclusions about this context we suggest a new environment for such an installation: the environment could have worked if it would have been a passage or open space but not a corner, the area needed to be big enough for better distinction of the 6 detection areas (around 6mx6m) and the distraction needed to be minimal. Examples of public spaces, but not at festivals could include: hospitals, waiting rooms, hotel lobbies or libraries.

The questionnaire showed a generally positive response of visitors to Sissy although they experienced Sissy to be complex. This could be explained by the questionnaire participants' mentioning of Sissy's nice aesthetics: the flipping dots in combination with the beamer projection resulted in a colourful installation that is worth looking at without understanding the interaction.

## CONCLUSION

In this paper we described the design and implementation of an interactive installation at an art and technology festival. The semi-structured interviews and questionnaires about visitors' experience of Sissy resulted in the following conclusions: Sissy's character descriptions were categorized in three groups. Explanations contained 'negative' characters like:

'scared, go away and fear', but also 'positive' ones: happy, curious and playful. In-between characters were also mentioned: aware, unpredictable, shy and keep an eye on you. Visitors indicated that they felt relaxed after experiencing Sissy. Other interesting findings show the misunderstanding by the greater part of visitors of Sissy's behaviour (disappearing when coming too close, appearing when taking more distance). The majority of the visitors spent less than one minute exploring Sissy and seemed biased by other installations that responded to light and did not notice Sissy responded to their body movement.

The questionnaire results showed the visitors had a positive opinion about Sissy in general and they considered Sissy to be alive or lively. Concluding the interview, questionnaire and observations show that we cannot define Sissy as being 'slow technology' since we could not confirm whether Sissy contributed to the relaxed feeling of the festival visitors, however the visitors were relaxed.

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