Activity Based Design for Real-Life Technology

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Abstract: In this project, we formulated a tool we called ‘sketch-based choreography for robot dancing.’ Using design information from the field concerning engineering and arts research this experimental project involved the design of a figure for use as an <activity and tool>. The design had the following two aspects: the ‘activity: a high school student's dance at a contest,’ and the ‘tool: the sketch-based choreography.’ The idea was to take a technical results approach to the ‘reality’ of everyday life. The following factors constituted the approach to the technology used by the artist-designer which enabled the figure’s design to be grounded in everyday life and in the vision it has developed within today's culture. The three factors were: (1) the goals of each scenario were drawn together team, (2) our visions were shared as we drew the goals of scenario together, and (3) even when we worked was separately, it worked followed the same direction was able.

Key words: activity based design, storyboard, scenario, robot, interface design,

1. Introduction

For this project, we designed what we call ‘sketch-based choreography for robot dancing.’ We considered to design what users want to do, how users want to do. The choreography is not an interface yet and is a description for robot dancing. Operation of a motion of robots need a complicated numerical input to all the joints that can be moved, and is not easy. Furthermore, in the motion which moves the whole body intricately like a dance, specification of a motion is difficult. It is easy to operate the interface of 'RoboJockey[Fig.1]' designed in consideration of the point. Although, with this interface, since it becomes a repetition of the pattern of a motion set by the rhythm, the music of a repetition of the same rhythm, the music of a repetition of the same rhythm is suited. But if the dance has melodies is difficult to use.

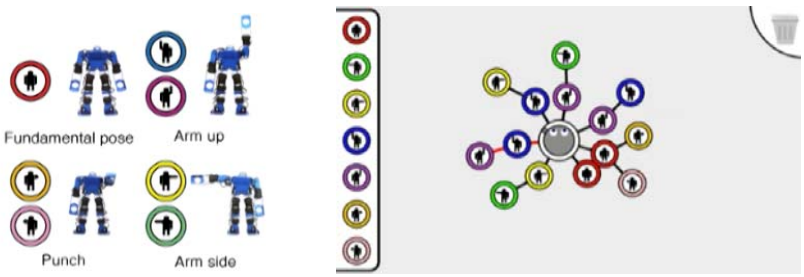

Figure.1 Interface of RoboJockey

2. 'Sketch-based choreography for robot dancing'

We designed the method of displaying with the person form which understands motions more nearly intuitively. The following four features were designed.

(A) The position of a robot's arm and leg in space [Fig.2].

(B) Choreography based on the analysis of a famous dance (form the song 'Choo Choo Train' performed by the band Exile) and on a cartoon illustration of people doing the dances [Fig.3].

(C)Choreography using photographs of a person performing of the dance, (A)[Fig.4].

(D)Choreography using the photographs of a robot performing of the dance, (A) [Fig.5].

As a result of inputting a motion using this choreography, a man-like motion which is not tried since a robot will reverse if it is usual was able to be taken in.

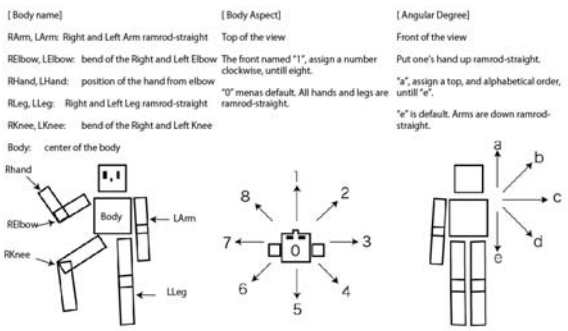

Figure 2. Descriptions of each position

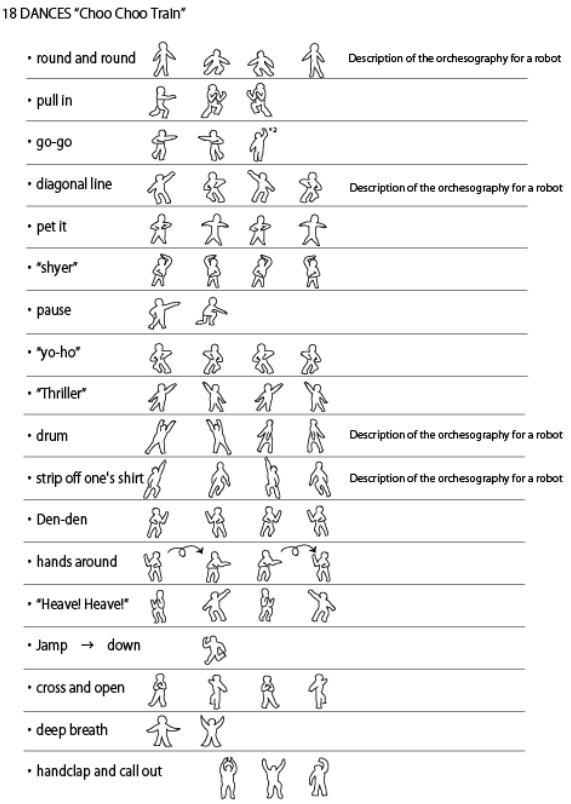

Figure 3. Choreography analysis of the dance using cartoon illustrations

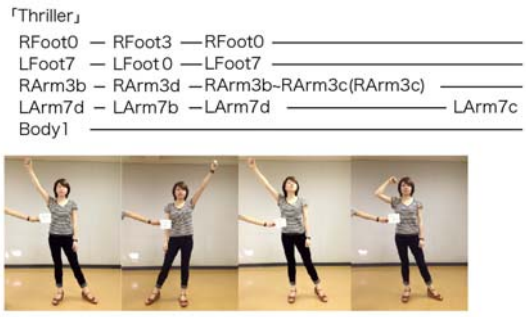

Figure 4. Choreography using photographs of a person doing the dance

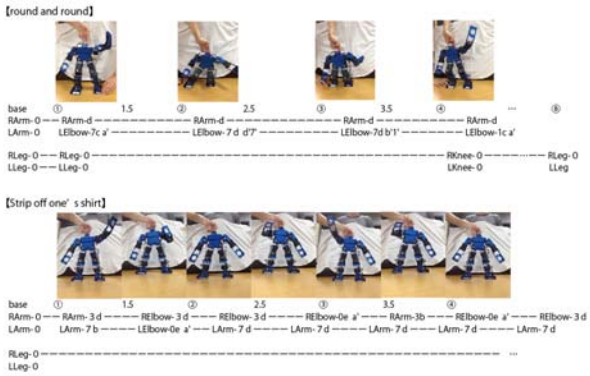

Figure 5. Choreography using photographs of the robot performing the dance

3. Design Process

The design team members were ‘artist-designers’ and ‘engineer-designers.’ ‘artist-designers’ are graphic designers and so on, as opposed to ‘engineer-designers,’ they try to make things look good’ [1]. The design was based on ‘RoboJockey’ which was designed by the team’s ‘engineer-designers’, and is now available.

The following were the three features that enabled us to to have carried out in their.

(1) The goals of each scenario were drawn together.

(2) Our visions were shared as we drew the scenarios together.

(3) Even when we worked separately, our work followed the same direction.

3.1 The goal of a scenario was drawn together

We drew the goal scenarios’ goals as follows. First, we shared childhood experiences. The engineer-designer who designed ‘RoboJoceky’ was absorbed in the model ‘Tamiya Mini 4WD Racer’ in the fifth grade. Second, we clarified the relevant elements of our childhood experiences. The most absorbing elements of the Tamiya Mini 4WD Racer were collecting, customizing and competing. “Collecting” refers to collecting the parts of the mini-car. “Customizing” meant enabling the car to run better by collecting more parts. “Competition” entailed customizing the car and competing against a friend’s car. We transposed these three elements to robot dancing. What would these elements look like in robot dancing? We thought of expressing a scene. Children will made robots compete in their school, and they will become robots that are programmed to which wanting that program of the robot which is doing the cool dance. The surely, robot dance programing is would contained in the pack. And probably, the pack is could probably exchangeable with a friend. A child who is good at programming will could surely program the robot dance by himself. We considerated the scene using a box and paper(Fig. 6), having turning collected materials complete child and making it saying word. We prepared a pack containing a dance program and a box of same size containing as a robot, and did such made complete each action currently operated. Each expressed by the method of performing(Fig.7) or drawing. The scenario became contents with all satisfactory participating members (Fig.8).

Figure.6 Using a box and paper

Figure.7 Acting out

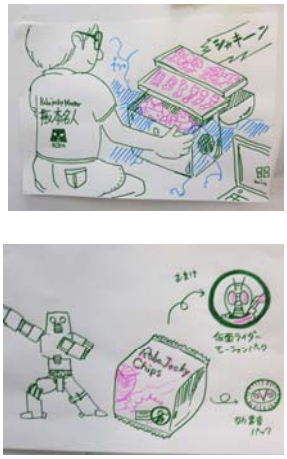

Figure.8 Idea sketches

Figure.9 Storyboard

3.2 We shared our visions by expressing them

Because there were many team members who experienced the same things, it was easy to relate to childhood experiences. When transposing the elements to robot dancing, we used improvisational paper prototyping. It can be said by that you can share others' experiences virtually by performing by themselves, or considering and speaking the words of the experience. Thus, we shared our visions being concerned with objects not as objects themselves but as subjects. Based on the storyboard, the target of fifth-grade boys was questioned. It turned out that many fifth-grade boys are not interested in dancing, so it was not realistic to target them. Then nest, adult people the original concept which design 'RoboJockey' examined dance again acting as perspective of a D.J. operate a robot. The engineer-designer had belonged when he was club at when he in hight school student, said the story that a robot club held a robot dancing contest was remade school festival based on their experience in the robot club in a hight school (Fig.10).

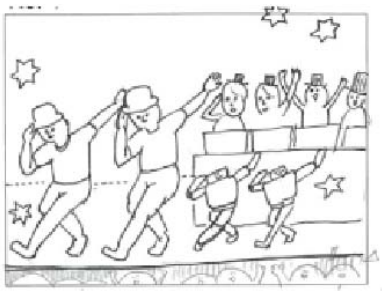

Figure.10 Sketch of the robot-dancing contest at the school festival

3.3 Even when members worked separately, the work followed the same direction

The dance of "Choo Choo Train" is described. First, the dance of "Choo Choo Train" was seen by movies at youtube. The original dance of EXILE (Fig. 11) was too difficult to understand. Instead the detail description of the dance (Fig.12) seems to be good for dancing by oneself, touch that explanation was impossible carried out explaining the method of a dance. The screen of just dance wii (Fig.13) was easier to understand the overall course of dance. Since the dance was likely to be deivided, it was able to divide into 60 pieces in eight beats. Then, the name was attached and divided into each motion (Fig.3). It interpreted what has happened to expression of a

motion, seeing mounted Choreography (Fig.3).

Figure.11 Exile performing the dance

Figure.12 Detailed description

Figure.13 Screen of 'Just Dance Wii'

Each step of the dance was classified. 'RoboJockey' (Fig.1) a displayed the positions of the hands, and described each movement. The belief was that what we needed was most likely just to make clear the positions of the arms and legs in space(Fig.2). Considering the way in which the dance was performed (Fig.2), a person danced out each step in order, and we photographed her (Fig.5).

In order to understand the full 'Choo Choo Train,' dance, we took photograps illustrating a person performing each dance step devided eight beats (Fig.3). With these photographs and cartoon illustrations of each step being performed (Fig.4), the engineer-designer determined that a robot could be directed to complete these motions. Photographs were taken of a robot conducting each of the dance steps (Fig.5). Eventually, the artist-designers proposed to the engineer-designers that a human should be photographed acting out the illustraions in Figures 2,4, and 5. Although the engineer-designer operate the moves into the photographs in look Figure 3.

4. Conclusions

Using this choreography, the motions of a robot became more realistic as a result of design work. In this way, the robot could have 'experience' based on turning the designer's own real experiences into a story. 'Artist-Designers' are ' training emphasizes "Invention," "Empathy," "Evaluation," "Visualization/representation"'[1]. They trained especially 'usage.' By creating the "storyboard" using collaboration, in which each designer did his or her own work, a design was developed that was suitable for a story. As a result, directivity was maintained by working together.

5. References

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