The Database on Near-Future Technologies for User Interface Design from SciFi Movies

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Abstract. Science fiction (SciFi) feature films offer viewers a glimpse into the future, revealing unique interfaces, social systems, and complex human relations. In this paper, we report a trial conducted by the Science Fiction Special Interest Group (SIG-SciFi) to gain insight into probable human-centered design (HCD) trends and the database of scenes collected to be used as good references for futuristic design. Characteristic scenes from the movie *Minority Report*, *X-Men II*, and *The Island* were analyzed. Our argument and analysis began with a top-down arrangement of scenes in descending order of importance. Then, extracted characteristic scenes were classified hierarchically while considering the worldview of the movie. As a result, suggestions were obtained pertaining to the direction of HCD in the near future. The results of this analysis are arranged into the database which can be immediately applied as a design tool.

Keywords: human centered design (HCD), user experience (UX), science fiction (SciFi) movie, user interface, database.

1 Introduction

In recent years, the importance of human centered design (HCD) is growing not only for industrial products but also for providing services. Simultaneously, especially in the highly-networked information society, various services are implemented as information-technology (IT) system. That results in forcing many designers to create a new form of interface design.

For instance, consider the interface of smartphones. Although similar mobile terminals as personal digital assistants (PDA) have been proposed in the early days of digital era, could anyone imagine the interface currently provided for the modern smartphones, in a previous decade? Obviously, there is a limit of imagination if they try to create their new designs based on the idea of an extension of existing interface technologies.
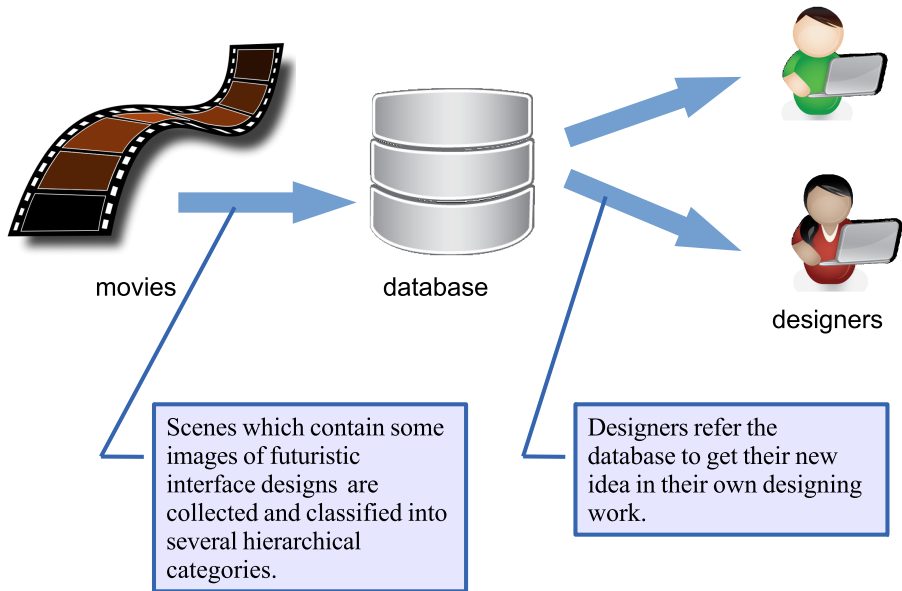
So we have to discuss another way to create novel designs. As a solution for this question, our research group asked for some ideas from science fiction (SciFi)

films. That is, we considered that the human-machine interactions represented in the SciFi films had a possibility to indicate a big suggestion to our user interface design in the near future.

In 2011, the special interest group named SIG-SciFi was organized in the Human- Centered Design Organization Japan (HCD-Net), in which members try to find some hints for their ideas in SciFi films. SIG-SciFi has maintained its activities until now, and we got several results useful for everyone involved in the HCD business activities. This paper reports our results and gives a proposal of a database system which can be a useful tool for designers.
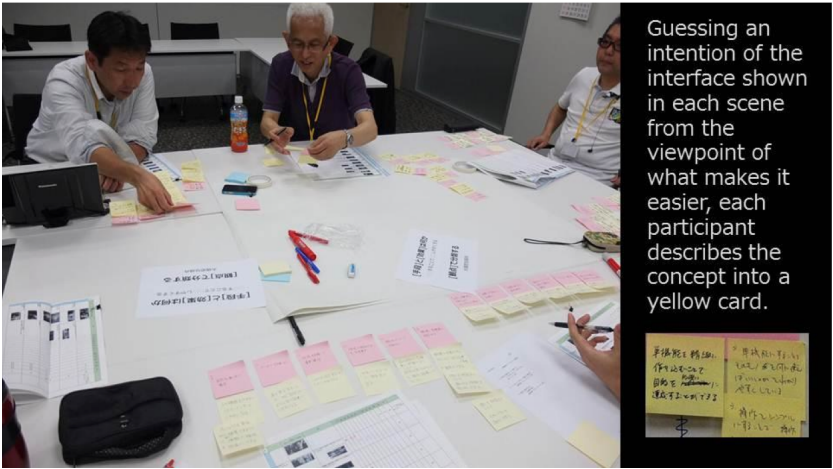
2   Database and IP Problem

SciFi movies contain several remarkable scenes in terms of a showcase of futuristic user interfaces. A collection of such scenes could be of some help. However, it will be more effective if such scenes are provided in an organized way. To make it widely used, its sources should be comprehensive, that is, it is better that scenes are gathered from a number of SciFi movies (Figure 1).

movies   database

designers

Scenes which contain some images of futuristic interface designs are collected and classified into several hierarchical categories.

Designers refer the database to get their new idea in their own designing work.

Fig. 1. The database record should have scene description, how to use them, class and category, and small clip from the original movie

In addition, it needs to be solved that the database does not violate intellectual properties (IP). For example, Shedroff and Noessel[1] published a book analyzing many scenes in SciFi movies, in which novel user interfaces were shown. In their book, many screenshots captured from the SciFi movies. To avoid violation of the IP rights of original movies, all of the pictures are small and stay in the confines of quotation (Figure 2).

Fig. 2. Only small pictures taken from the SciFi movies are available in the book to avoid violation of intellectual properties

3 Our Approach

In this section, we describe overviews of our method and results.

3.1 An Overview of the Process

The members of SIG-SciFi carried out their tasks and discussions in the following procedure.

1. The target movie is decided by discussions and votes.
2. Each member watches the movie and extract the remarkable scenes.
3. In the regular meeting, the scenes are arranged, by taking what is good and by leaving what is bad (Figure 3).

Guessing an intention of the interface shown in each scene from the viewpoint of what makes it easier, each participant describes the concept into a yellow card.

Fig. 3. By estimating the intended purpose of the interface in each scene, each participant describes the concept on a yellow card

4. Based on the information of scenes arranged by previous process, a database model is created. It has a hierarchical structure and the scenes are categorized in a several groups by means of objectives of the interface design.

Our discussion has gotten started with *Minority Report* (2002). The movie has been studied so widely that it has been considered as a landmark of near-futuristic interface in the interface design community[2,3,4]. Nearly 30 specialists from institutions such as MIT scrutinized various interface-related technologies depicted in this movie. After the prototype of our scene database was finished, the target of our discussion was moved on to *X-Men II* (2003) and *The Island* (2005).

3.2   Results of Classification Analysis

Several examples of comments for the typical scenes in *Minority Report* are shown in Table 1[1].

Figure 4 shows an example of the database, in which scenes extracted from the movie are categorized into several groups and the groups are hierarchically arranged from large classes to small classes.

A scenario to utilize the database is as follows:

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[1] Discussion was conducted in Japanese because all of the members are Japanese citizen. Therefore, the original examples are written in Japanese.

Table 1. Examples of scenes selected from *Minority Report*

Title	Description
Smart feedback	Heart warming message is provided when the system need to atract user's attention.
Simple and easy to understand	Simple function and operation fitting together with real world are easy to understand.
Visualization of operation	In the scene where data are copied into a memory device with translucent liquid-crystal-display, operating principle can be seen directly.
Humane interface	Light is turned on by calling "I'm home," which is a user interface operated by natural conversation.
Transportation device	Vehicle which can run horizontally and vertically has two entrance, a driver who entered from both of them can operate the vehicle. Not only automatic operation but also automatic operation are available.
Overlay display of information	A scene showing detectives analyze precognitive images delivered by *precogs* using gloves and gestures. Time scale is shown overlaying on the video image.
Natural operation (1)	Splitting, enhancing, and discarding. Gesture operation is suited for particular operations using big screen.
Natural operation (2)	Playing and editing video (images) on the over-head projector, with the gloves for gesture recognition.
Data visualization	Visualizing the data transfer. Information display on the memory card. Data can be handled as if they are some objects.
Scene recognition and verbal operation	Controlling devices by verbal commands.
Partly volumetric display	In the stereoscopic vision by projection, some target objects are extracted and displayed in the three-dimensions.
Visualization of images in brain	Playing the images in *precogs'* brain, extracted by the helmet-type devices.
⋮	⋮

1. A user consults the database with ambiguous awareness of his/her problems. The database offers large categories to fit the ambiguous problems.

2. After a large category is selected, smaller groups within the category are chosen in terms of its solutions represented most appropriately.

3. User could get an idea to solve the problem according to the case study shown in the scenes selected from the database.

The uniqueness of our database is that not only the literal information but also a fragment of movies specified by the data record are provided. Visual information has a strong power to explain so that it makes user imagine how the interfaces can be used.
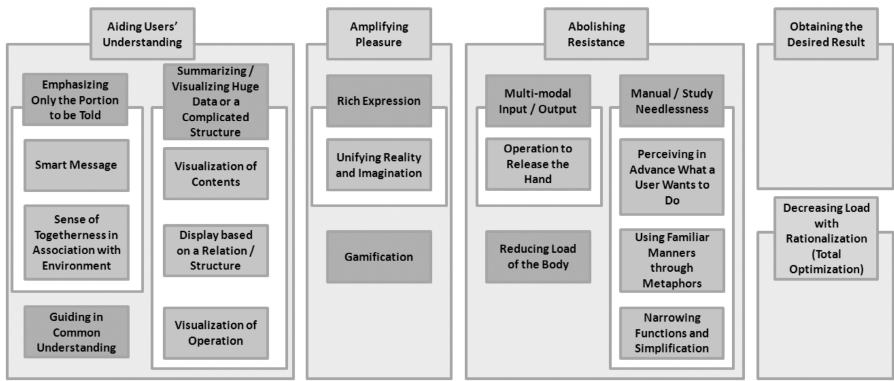
Aiding Users' Understanding		Amplifying Pleasure	Abolishing Resistance		Obtaining the Desired Result
Emphasizing Only the Portion to be Told	Summarizing / Visualizing Huge Data or a Complicated Structure	Rich Expression	Multi-modal Input / Output	Manual / Study Needlessness	
Smart Message	Visualization of Contents	Unifying Reality and Imagination	Operation to Release the Hand	Perceiving in Advance What a User Wants to Do	
Sense of Togetherness in Association with Environment	Display based on a Relation / Structure	Gamification	Reducing Load of the Body	Using Familiar Manners through Metaphors	Decreasing Load with Rationalization (Total Optimization)
Guiding in Common Understanding	Visualization of Operation			Narrowing Functions and Simplification	

Fig. 4. Classification of user interfaces shown in *Minority Report*

4   Solution for the IP Problem

Previously mentioned, the database contains visual information and it is considered useful to explain how the futuristic interface is effective. However, the IP problems should be eliminated if the database is open to public. It needs to provide some techniques to avoid IP violation because the movies are protected by the copyright law.

Now we are planning to make the database which can provide fragments of movies without IP violation, by means of connecting the database and a DVD/BD player which can be controlled by the database (Figure 5). In order
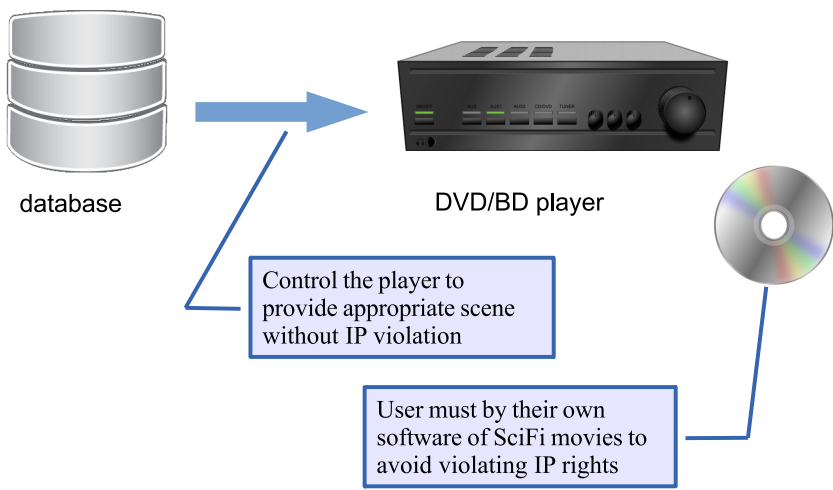

database   DVD/BD player

Control the player to provide appropriate scene without IP violation

User must by their own software of SciFi movies to avoid violating IP rights

Fig. 5. A system being planned that contains the database and the DVD/BD player in order to avoid the IP problem

to realize this idea, there are several problems to be solved; Whether there is a suitable DVD/BD player which can be controlled properly from outside or not? Even if it exists, how the appropriate video clips can be extracted? They have to be made clear before the system will be implemented.

5   Related Work

It is not considered as absurd trial to study the relation of artifact and human being through the discussions on the near-futuristic interface and UX shown in the SciFi movies, because the phenomenon of the embodiment of fictions has already been found everywhere any longer. The existence of many similar studies justifies and reinforces the idea as well.

For instance, Schmitz, *et al.*[5] has reported a survey on the user interfaces drawn in SciFi movies. Fishwick[6] also pointed out that gaining ideas from SciFi was practically effective in his discussion on the modeling environment in the future.

In addition, Marcus comprehensively discussed on the relation between the computer human interaction (CHI) study and SciFi movies. In his paper[7], he describes that SciFi movies and CHI are tightly connected and that they have been developed complementally influencing each other. He also noted that not only CHI researchers learn from SciFi but also authors of SciFi should learn from CHI researchers in order to create smarter representations of the interaction.

6   Conclusions and Future Work

In this paper, activities and results of SIG-SciFi organized in HCD-Net Japan has been explained. The SIG members implemented the database whose records contains scene title, description, class and category, and timecode to the scene concerned in the movie. Scenes were collected famous three SciFi movies, *Minority Report*, *X-Men II*, and *The Island*, and they were arranged hierarchically according to the objective of the user interface fascinatingly represented in the movie.

A small clip of movies representing the user interface in details should be stored into the database record, so that it can visually explain the scenes intuitively. However, if the movie data are stored into the database directly, it would be violating the IP rights of the original movies. To avoid such violation, a novel and little bit tricky system design is proposed. That is, the source of movie clip is separated from the database and DVD/BD media, which have proper IP rights to the owner of the media, are used.

There are some problems to realize the database system in cooperation with the DVD/BD player. These further studies are left as the future work.

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