

Re-reading String for Designing Interfaces in Animated Movies

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ABSTRACT

In this paper, we address the current status of fictional interfaces in movies and their effects on population and developing technologies. While they carry no such intention, the unrealistic interaction scenes in the movies affect popular tendencies and therefore the technologic developments. This study is on the application of the "re-reading model in design", a design practice we have used in previous studies, on an everyday instrument, "string" with the aim of leading the animation artists to design more realistic interfaces without sacrificing from impressiveness.

Keywords

Interaction Design, Design Practice, Animated Movie, Human Computer Interaction (HCI), Tangible User Interfaces (TUI's), Experimental design, Design Methods, Interaction Techniques.

1. INTRODUCTION

The futuristic interfaces designed for fiction movies hold many clues for what we may see in actual future interfaces. Yet, we examine these interfaces to evolve into more detailed and complex forms in each popular movie as opposed to researchers advocating simpler and more intuitive interfaces in real life [1, 2]. This conscious complexity in the movies has the goals of expressing the genius and mastery of the protagonist and enchanting the viewer with such talent. On the contrary, in real life the user isn't, or shouldn't be expected to be as skillful and experienced. Therefore this complexity tendency of movie interfaces causes us to have an unrealistic projection of the future [3].

It is more or less undeniable that the gestural user interfaces (GI's) are going to be a significant part of the future human life. In many futuristic interface examples we see in movies the protagonist successfully completes many complex operations with pre-learned knowledge such as in GI's (*Johnny Mnemonic*, *Minority Report*), eye tracking user interfaces (UI's) (*Iron Man*), voice activated UI's (*Star Trek*), holographic UI's (*Avatar*), transparent UI's, adaptive UI's. Again we can observe the lack of feedback and predictability elements, together with physically exhausting interaction concepts. Such interfaces are called "audience interfaces" instead of user interfaces [4].

We can claim such unrealism, or usability mistakes of movie interfaces are not important as long as they fulfill the entertainment criteria. Eventually the way these interfaces and the scenes of their use are designed to serve the purposes of visibility, visual impressiveness and expression of the protagonists' talents. Likewise, we can overlook the technological inapplicability issues

and see these as elements that push the technology market forward. Yet the lack of realism they have on the physical and cognitive ergonomics side brings up two major problems: Firstly they mislead the market demand into a visually satisfying but unrealistic direction and thus create a significant waste of research funds, to which we can exemplify Minority Report's interface designer John Underkoffler's efforts to launch the same interface to the market. Secondly they mislead the user beliefs as well; making them think working through such complex interfaces is a piece of cake and despise themselves for their lack of talent as soon as they get to interact with an unusual interface.

So, do these movie scenes of futuristic interactions, despite usually being designed by interface designers, have to be useless in order to be impressive? The answer would be yes, if we recognize these fictional interfaces as a part of the distant future, since it is commonly accepted that interface designs based on today's realistic technology are unimpressive. Yet we choose to believe that interfaces which satisfy the viewer visually and also illuminate the future of real life interfaces can be designed with the inspiration from timeless applications that have always been in our lives.

Yet, we know for a fact that current interaction design education doesn't encourage designers to create extremely futuristic and visually satisfying interface designs. We also believe that the existing inapplicable interface concepts in the movies are also caused by this fact. We think we have to take a new approach for this goal.

Obviously, in the light of the specifications above, our main perspective includes the movies that rely heavily on computer generated animation (CGA) such as *Avatar* and *District 9*. We believe that our concerns stated above will perish if the designers lead the process right while designing interfaces for CGA movies.

Departing from this suggestion, this paper questions what training process should the CGA artist fulfill in order to (1) make better designs all over, (2) giving the viewer a more realistic perspective as to what the future of interfaces might hold, (3) not sacrifice and even improve the impressiveness factor over the viewer while doing so.

2. RE-READING MODEL IN DESIGN FOR TRAINING ANIMATORS

We consider "re-reading in design" that we developed in our earlier studies, as an effective model for achieving the goal above.

Within a series of researches we conducted since 2001, we have suggested taking inspiration from formal solutions of past cultures might be a fruitful way to develop innovative ideas in the field of interactive media design. We name this method as “re-reading in design”. In order to prove our hypothesis we have analyzed this method over Traditional Turkish Shadow Play [5], Turkish Miniature Art [6] and Traditional Turkish Calligraphy [7]. We can claim that we have put forward a series of realistic sources of inspiration that will produce significant benefits to interactive media design.

In the first research on Turkish Shadow Play we encountered four different screen and viewing setups as “two sided viewing”, “playing without a screen”, “spatial viewing” and “interaction between the image and the actor”, and in the experimental studies we conducted with students, with the consideration of possible future technologies, we saw that unordinary design ideas may come out [5].

In the second research we applied on Traditional Turkish Miniature Art that we consider to be the ancestor of contemporary visual information design, we claimed that properties of this art such as “mapping”, “scaling”, “bonding diagrams”, “symbolization”, “framing”, “separation” and “representation of separate spatial and temporal features together” can be useful sources of inspiration. We asked the interactive media design students to exploit these sources of inspiration and build innovative information design ideas using contemporary technology and subjects without imitating the style of miniature. We got the conclusion that unusual design ideas can be achieved by the students using this method [6].

In our third study over Traditional Turkish Calligraphy, we took inspiration from the methods and philosophy of this art that focuses on full body use, for digital interaction and we have witnessed once again that innovative solutions can be obtained for gestural interfaces that allow the use of natural body movements [7].

In the light of the positive results we got out of the studies above that are based on “re-reading in design” method, we have the courage to use this method on other subjects that we need inspiration. Our studies have led us to believe that, not only cultural methods from the past, but also our daily life habits can prove to be resourceful in finding inspiration to develop realistic and usable futuristic interface designs for CGA movies. We believe that an instrument we use with many different purposes, “string”, which has not been studied previously in terms of interface design, can be a valid source of inspiration.

3. METHOD

3.1 Re-reading the String

We think that re-reading the string, an instrument that the humans have used for many different and complex purposes since pre-historic ages, is an effective case for training a CGA artist in the perspective of interaction design.

In order to understand the importance of the inspiration from string, we have to begin with observing its distinctive qualities:

1. Bonding, 2. Lineation, 3. Modality, 4. Knotting, 5. Information design [8].

The use of string has several advantages over any other instrument in design thinking. For example, the knots on the strings help us comprehend the fact that a line is composed of dots that are not perceivable when drawn on a paper. There are many ways to interact with a string, various knots, knitting and textures can be achieved, it can combine with other strings to produce a thicker one or dissolve to thinner ones. It is possible to manipulate the form of a string continuously and easily with hands as opposed to a line on paper or screen. Again, the string is spatial while a line on screen or paper is planar. This renders the string more open to randomness. Creating a lines form on screen or paper is more or less a conscious action while the string may take unexpected and unintentional forms. While the paper and screen have their own advantages, such features of the string bring up a spatial added value when taking inspiration. Simply playing with a piece of string is an inspiring action both with its form and use.

Therefore we consider design practices with the sting can give many inspirational leads to interaction possibilities. With the re-reading study above, we’ve derived such a design practice study in order to identify these inspirational points.

3.2 Design Practices on String with the Re-reading Method

With the perspective stated above; we consider two separate practices can be conducted in order to take inspiration from the string and help artists design better interfaces for CGA movies. We name these practices as *(1) awareness, (2) design scenario*.

The awareness practice is important for the CGA artists that are used to work with a computer or pen and paper to get familiar with working with strings. We believe that the result would be more effective should the artist begin with exploring the added values of string prior to addressing the design problem of this paper.

We propose various steps for this awareness practice:

First of all, the artist is supposed to explore the possibilities of exploiting the shifting form of the string in order to create a message with it. We believe this will help to achieve both a design constriction and an idea for a composition. Our goal in this unusual practice is to help the artist not only have some interface ideas but also expand his idea generation capacity.

Exploring the string requires playing with it in different ways. The first study should be on seeing how strings can be controlled and modified. Without a predefined goal, the artist should be given the opportunity to use and play with strings of different qualities

(material, thickness, length). This practice aims to help the artist explore various features of the string such as flexibility, transfiguration, tightness and how it can be separated into fibers.

After a brief exploration of interacting with a single string, a second similar study will be conducted with multiple strings in order to practice ties, weaves, nets and conjunctions. A final study will be made with strings using additional helpful instruments (weights, objects that can provide pivot points, pulleys) to observe qualities such as lifting, fastening, friction, cutting and separating.

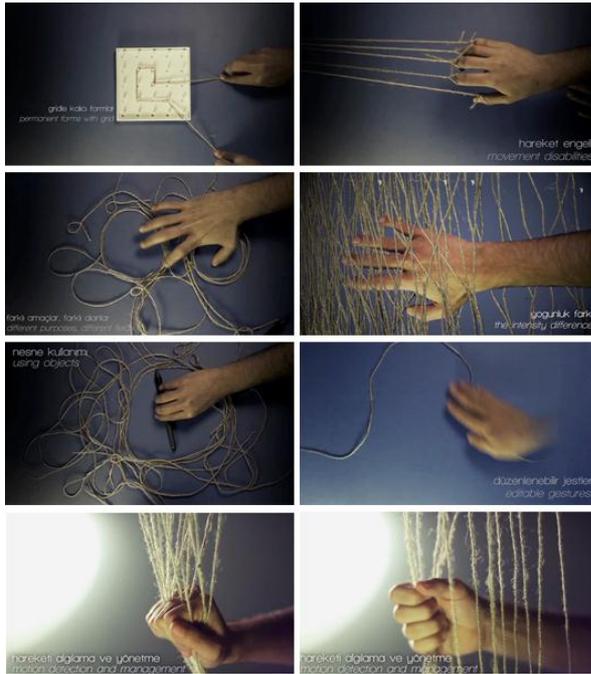


Figure 1. Awareness practice on string.

We think that as a result of these practices, many inspirational points from string can be achieved to design fictional interfaces that allow many interactional possibilities for CGA movies without conveying unrealistic or excessively complex methods.

In the second phase of practices, namely the design scenario, we are going to ask the CGA artist to design a futuristic but technologically realistic and meaningful interface to be used in an animated movie with the inspiration from the string. In the design scenario we expect the artist to use string's following properties: Transfiguration, Separation/Conjunction, Knot/Marking and Fastening.

Yet again we are going to ask said properties to be used only in controls that are needed in the scenario for which the interface is designed. Therefore, the artist is to predetermine which controls and other interactions can prove to add value to the fiction. We suggest the artist to put forward ideas on which interactions are meaningful or impressive for the viewer and which are needlessly complex or unidentifiable by the audience in the initial sketch of the scenario, to achieve our goal for a realistic interaction that will help enlighten the future.

According to this outline, the CGA artist that we studied with has written up an interface scenario for an animated movie and moved on to the project process.

The setting of the animated movie is as follows: In the times that the earth consisted of a single continent, a young and curious explorer who's used to travel to further lands, one day comes home only to find his village burnt down to ashes by evil forces. He prays the goddess *Aichatra* to give him supernatural powers so that he can end the villainy in the world and avenge his folk. The goddess asks the young explorer to steal the robes of ten most powerful wizards of the past from their graves and bring them to her. She separates the robes into their fibers and combines them into a magical staff that allows the explorer to find his way to the evil forces. And so a fantastic journey begins.

A brief video that shows the use of the interface can be viewed via this link:

<http://www.youtube.com/watch?v=ikUTKDYb9DA&feature=youtu.be>

4. OUTCOMES

At the end of the process we believe we have achieved creative ideas that can bring light to the future of interaction even if they are based on imaginary/futuristic technologies and have little applicability as of today.

The interface that is a result of our design practice is used by the protagonist of an animated movie to explore the environment in addition to transforming into a transport and a combat device. Within these functions it embodied many commands that can be resourceful for future entertainment interfaces. We evaluated these functions according to the features we have defined, in the perspective of futuristic and functionality factors.

Transfiguration: The fact that the form of the interface device can be changed according to the needed function is a solution to the problem of using a device of a single set ergonomic properties for various functions someone which are inappropriate or do not serve a purpose other than impressing the audience with visual effects. Also, most entertainment interface devices of today are designed in a static form and more often than not they are either used for inappropriate functions that don't refer to the commands they give, or require additional devices such as driving wheels, weapons and musical instruments for every little separate function. Below picture shows the designed interface used for exploration and combat functions. This way the device becomes more impressive and gets more air in the movie in harmony with the scene without falling to redundant actions.

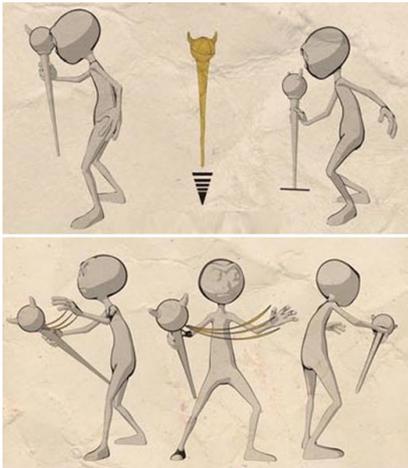


Figure 2. Exploration and combat modes of the interface device.

Separation/Conjunction: Most existing interface devices are decorated with lots of buttons and sticks to perform separate functions simultaneously. But as these extensions do not change according to the application they create physical and cognitive complexity in addition to taking up significant space even when not used, not to mention there are situations their numbers are considered not enough. The artist has designed an interface that can bring up additional control extensions by separating into thin fibers like a rope does, whenever necessary and recombine into a single body when additional extensions are not needed. Apart from addressing a problem in the current interfaces, this feature both provides better visibility and directivity for the audience and allows impressive visual effects.

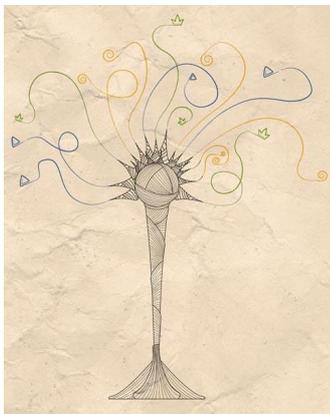


Figure 3. Features inspired from string's separation into fibers.

Knot/Marking: The futuristic interface in the project produces signs and marks over its display and control extensions to define their functions according to the application used so that the control is more predictable and the learning curve is shorter. This makes more complex control layouts and functions more believable and easier to understand for the audience. This feature also addresses a problem in the current interface devices which have no predictability clues for each changing function and thus make the users need to memorize many complicated interactions

for each application they use. This cognitive problem often causes the users to refrain from using unknown applications.



Figure 4. Marks indicating control functions.

Fastening: With the inspiration from the string, we believe that physical interfaces can be designed to use the advantages of physical interaction with other objects apart from the users, whereas current technological and productional problems limit such possibilities. Many interface devices connect to other digital devices only with 3rd party apparatus for tasks such as variable functions and battery charging. In this project, the chosen flexible materials allow the interface to be fixated on the ground, body parts, or other non-digital objects in order to identify them, carry them, and even use their stability thus give the interface new uses. This also allows the interface to be used in scenes of the animated movie without taking the main focus and replacing some other instruments that the protagonist needs throughout his adventures.

5. CONCLUSION

The subject of the study has been useful not only for designing impressive and realistic interfaces for animated movies, but also for shedding light upon functional possibilities on future interfaces. We believe it is a positive step towards overcoming current restrictions of interface technologies with the use of unusual materials. In the light of this study, we can foresee that the future of interface device technologies will tend to have variable functions and universal compatibility.

The string which is an instrument the humanity has been interacting for ages and still being used in many diverse areas in this age of technology can provide inspirational points for future interfaces beyond expectations. Aside from the fact that people are familiar with the string due to its uses in daily life, its properties bring up various functions that need to be further explored. In this study we chose to inspire from the most basic attributes of the string, but it has many other and more complex uses out there that can provide novel outcomes, waiting to be explored.

Most significant outcomes of the project developed with the inspiration of string is cognitive, physical and ergonomic adaptability, which already are some of the most used properties of the string throughout the history. The futuristic requirements of a fictional animated movie allow us to look for solutions in unconventional areas for problems, in this case, of interfaces that provide control for multiple applications. The string, with its many different uses in daily life, gives us a good point of inspiration for such purpose.

Another significant novelty is beneath the outcomes in the compatibility section. We believe that, once flexible structure of the string that we interact with other objects with ease is applied to physical interfaces; it will bring many different uses to interfaces.

Researching other materials than string, that the designers can take inspiration from, for futuristic interfaces will not only benefit the movie industry but also provide motivation for future interface technologies.

We believe that the design practices we derived by re-reading the use of string may prove to be a valuable alternative to current idea generation methods for purposes of futuristic interface designs.

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