

Chapter 6

Lookable User Interfaces and 3D

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ABSTRACT

A new philosophy of user interface design is described. Named the “Lookable User Interface,” or LUI, the approach is based on the concept of a Personal Reality (PR) system. Here the computer adapts to the user’s worldview in a personalized way, and according to the specific requirements, behaviors, and perceptive skills of the individual. Typically, a PR system creates and adjusts (in real-time) 3D perspective view(s) of a data-set, including (potentially) the field of view of a scene and the apparent distance and scale of objects, whilst also creating an aesthetic “eye-friendly” context for computing operations. A Lookable User Interface (LUI) affords the maximum degree of visual accessibility to digital content. The authors examine the results of testing a Lookable User Interface. Spectasia is one example of a Personal Virtual Reality (PVR) that can be used to visualize links between universals and particulars within digital worlds.

INTRODUCTION

We apply the concept of the Lookable User Interface to computer system design; and in particular with respect to the efficient navigation of information structures / hierarchies. A personalized approach to user interface design is developed, and in-part through analogy to the natural three-dimensional “curvilinear” shape of the human visual field.

The concept of Personal Virtual Reality (PVR) is compared and contrasted with Virtual Reality. PVR systems are put forward as a (partial) solution to the problem of providing sufficient “context” within information views. Addressed is the difficulty in providing rapid overviews and/or fostering explorative freedom within complex information structures.

Today the scope, scale and richness of information systems causes data “bottle-necks” to gather wherever people interface with computers. Especially problematic is knowing anything of what you do not know, and in terms of information hidden in vast data-mountains. Unfortunately, tools like Google

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search require users to ask the right questions and/or to use valid keywords in order to locate specific items. And much remains unseen. Must we rely on luck to locate interesting content? On the contrary, we recommend the attributes of the Lookable User Interface as a (partial) solution, allowing the user to (visually) boost his/her knowledge of available content.

THE USER INTERFACE: HOW SHALL WE DEFINE THE “USER INTERFACE” (UI)?

In the 1991 book “Computers as Theatre”, Brenda Laurel states that we should think of - and design - a computer interface in terms of a theatrical metaphor (Laurel, 1991). Her idea is that like effective drama, good interface design must engage the user in both thought and emotion. Laurel also says that the user interface (UI) in a way obstructs access, and that it stands in the way between us and what we are trying to do. This is a useful perspective. But it is by no means the only one.

Others have spoken in terms of overcoming the communication barriers that exist between one world and another. For example, sending messages between the hidden digital “world” of the computer, and the human “world” of language and vision. In this view, actions in one world must be “interfaced” using a language of commands that both “sides” know how to interpret. Thus the happenings in one world must be communicated (and translated) into an entirely different realm. The UI’s “job” is to hide unnecessary complexity and to expose public events/actions/information in each world, and so to mediate between the different regions of being. From this perspective, there are many different types of UIs; including operating systems, TV remotes, and washing machine controls etc. Even language itself, which communicates the thoughts of one individual to another, may be seen as special kind of UI.

Ideally, a UI provides useful views into an information space; according to the actions, behaviors, choices, and needs of the user. And this would perhaps be a relatively straightforward task, if it were not for the great diversity of different types of computer system, varying purposes, and the vast complexity of information types dealt with. To say nothing of the great range - and constantly changing - user interests. A large variety of different types of UI designs (and interaction techniques) are needed to cope with such diversity of purpose.

Over the last 50 years there have been many innovations in UI design. For example, in the 1960s, Sketchpad introduced interactive graphics (Sutherland, 1963). Soon after the mouse - and other key elements in the field of human-computer interaction - were invented by Douglas Englebart (Tuck, 2013). Later the Xerox Star system (Johnson et al., 1989) was introduced and the PARC user interface (Hiltzik, 1999) arrived which pioneered graphical elements such as windows, menus, radio buttons, check boxes and icons. More recently also, the touch-screen approach has been used on mobile computers and even full-sized displays. And the success of all of these techniques (generally) has led to an explosion in number and types of user interface designs. Progress has been so rapid, that in today’s world, it would be difficult to get through even a single day without using multiple UIs.

Sometimes it is difficult for the UI designer to decide what type (or set) of interaction tools is best for a particular application. One approach is to split larger interaction methods into smaller components, in an attempt to form a “language” of human-computer interactions, and to then re-assemble the standard techniques according to need. Obviously in so doing, it is vital to match appropriate techniques to the nature of the task at hand. However such an approach assumes that all of the useful interaction techniques

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