

9. Interaction Design

Synopsis

This module provides an introduction to interactive media and interaction design.

Lectures

- 9.1 Interactive Media
- 9.2 Principles of Interaction Design
- 9.3 Some New Directions

9.2 Principles of Interaction Design



Fig.9.2.01

When you lifted the receiver the dial tone told you that the phone was alive and awaited your inputs. You turned the dial, punched the numbers or simply used a voice activated application to make a call.

Visibility

This suggests that a device should offer clear visual clues about its state of readiness to perform some action.



Fig.9.2.02

Make a list of all the devices you use from the time you awaken till the time you get to bed. In order to understand the principles of interaction design, look at each of your interactions. In a day's time you should have a big list of principles that work, and bad ideas that do not.

Feedback

An important principle that affirms that some action of yours has been registered, This may be in the form of a highlighted button that has been clicked; an audio feedback that something has been pressed, an animated status bar that tells you that some action is happening.



Fig.9.2.03

Voice operated intelligent systems could perform routine tasks by asking the user to choose from a set of options. This is not quite the same as speaking to a human operator, but the function of the machine was precisely to take over the mindless task. Whether this is indeed a long-standing solution is something that time shall tell.

Affordances

There should be a link between the appearance and the function of a device. In a newly fashioned device this link might not be obvious but gets established over a period of time. An ATM machine that looked like refrigerator would be a cause of confusion.



Fig.9.2.04

Work out the sequence of inputs and response screens typically encountered while withdrawing money from an ATM. Make a flow-chart and see if certain operations are redundant. How much redundancy should be built into interactions, is a question that depends on the degree of safety that is sought.

Mapping

The relationship between different controls and the functions they perform should be logical and evident. Television remote controls can be exasperating as the mapping of the controls to the functions they serve is often not evident.



Fig.9.2.05

The early mouse-based input devices did not have a right click option or the ability to scroll using the forefinger. As the use of graphic user interfaces increased interaction designers studied users and added innovative mechanisms.

Constraint

Mechanisms and features that communicate what can and what cannot be done are useful for every device has certain constraints. To what extent can one rotate a swivelling monitor; how hard should one press on a touch screen; what pressure should be applied to a power-steering – these are some examples of constraints while interacting with devices.



Fig.9.2.06

The design of powerful chips that could support online rendering in real time situations encountered while playing games, greatly enhanced the graphic capabilities of game consoles and other hand held devices.

User-Studies

New ideas for interactive devices are often an outcome of understanding user needs. Interaction designers undertake systematic user studies and analysis in order to devise appropriate and usable solutions.



Fig.9.2.07

Blood sugar testing for diabetes patients was a fairly cumbersome procedure that took several hours. User studies supported by electronics and product design led to a device that could be used at homes, without the intervention of a doctor or a testing laboratory. Interaction designers build soft prototypes to test initial ideas.



Fig.9.2.08

The design of control panels requires careful thought. What are the critical feedback and control mechanisms that a device needs? How should they be organized? To create the right interactivities required by a machine, one should be able to think and respond like one. Machines cannot become intelligent, till an intelligent human being infuses them with this.

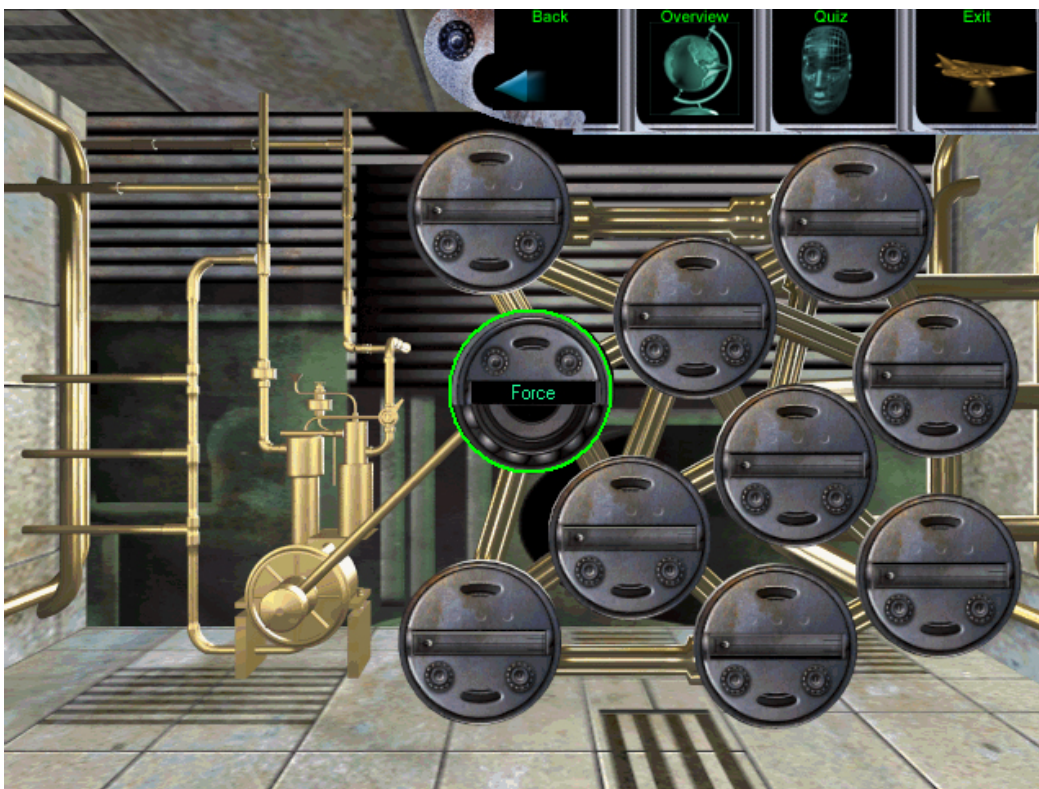


Fig.9.2.09

Visual design is another important aspect of designing interactivity. The image above shows an interactive physics lesson that allows the student to choose subjects, topics and concepts to be studied, take a quiz, perform an interactive experiment. Navigating through this in a virtual environment should be such that it appears sensible at all times. Maintaining a history of actions, providing reinforcing reminders and seeking confirmation simulate learning in a real life environment.