**Human-Computer Interaction**

We'll start with the first part of this trilogy - the human.

In order to design something for someone, we need to understand the capabilities of that person, e.g.:

* What is easy for them
* What is difficult for them
* What is impossible for them

Findings from research in *cognitive psychology* can help us understand people.

However, such research is not easy to apply to design.

One approach is to develop a simplified model of a human, incorporating only those aspects that are of interest to the designer of an interactive system.

It's helpful to think of humans as intelligent information-processing systems, similar to computer systems.

Such systems comprise:

* Input
* Processing
* Storage
* Output

This is a simplification because:

* It ignores social and environmental factors
* Processing and memory are not centralised
* Etc.

However, using a model - even an incomplete one - is easier than trying to apply research findings directly to design.

An example is the *Model Human Processor*, developed by Card, Moran and Newel in 1983

The Model Human Processor comprises three subsystems:

* The Perceptual System, handling sensory stimulation from the outside world
* The Motor System, which controls actions
* The Cognitive System, which connects the two

Each sub-system has its own processor and memory.

The model also includes a number of *principles of operation* which determine its behaviour under various circumstances.

The *Model Human Processor* is now quite dated.

Many newer models have been proposed, but interaction devices and techniques develop so fast that models date rapidly.

Rather than study a particular model (or models), we'll consider:

* Research findings from physiology, cognitive science and other disciplines
* The way in which such research findings can be assembled into models for use in the design of interactive systems.

This will enable us both to understand existing models and to extend or modify them to suit our needs.

Of the five senses, only sight, hearing and touch are used significantly when interacting with computers.

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| Human-to-Machine | tactile (keyboard, mouse, joystick, etc.) |
|  | aural (speech recognition) |
|  | visual (gesture recognition) |
|  | | |
| Machine-to-Human | visual (text, images, etc.) |  |
|  | aural (speech & non-speech sounds) |  |
|  | tactile (key-response, Braille, force-feedback, etc.) |  |

These three senses will be considered separately.