Human-Computer Interaction

COMS30029

aka **#HCI_Theory**

Oussama Metatla and Dan Bennett

Week 2: First Wave

Chunk 1: Introduction

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Chunk 1: Introduction

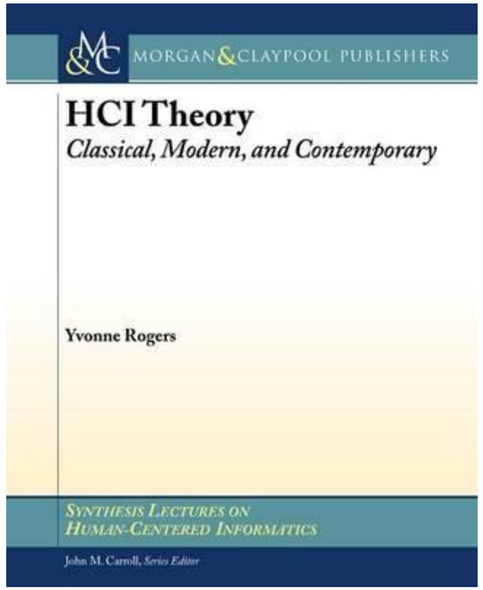
How did people think in the early days of HCI?

First wave of HCI

- 1980s-1990s
- HCI as an applied science, grounded in lab research
- An information processing perspective, from cognitive psychology
- Still influential today (though in many cases superseded)

Reading

Chapter 4:



Rogers, Y. (2012). HCI theory: classical, modern, and contemporary. *Synthesis lectures on human-centered informatics*, *5*(2), 1-129.

+ Choose one of…

A more in-depth look at Fitts' Law

A nice interactive explanation of Fitts' Law and why it matters
https://timmarco.com/fitts/

Meta theory: discussion of theory use in design

Beck & Stolterman: *Examining Practical, Everyday Theory Use in Design Research (2016) – search google scholar*

Seminal account of why HCI should move away from "hard" science (tougher read)

Carroll & Campbell: *Softening Up Hard Science: reply to Newell and Card (1986) – search google scholar*

Broad theoretical approaches in the first era

Paradigm: Scientific, grounded in lab based cognitive psychology. Computational, centralized, symbol processing view

Goal: How do *individuals* make use of computational technologies, and *how can technologies be designed to be more usable, and useful*.

Main Approaches to Theory:

1.Using Isolated Ideas from basic science disciplines

2.Applying theories from basic science disciplines

3.Developing new HCI-specific theory, grounded in lab science disciplines

1. Using Isolated Ideas from basic science disciplines

THE MAGICAL NUMBER SEVEN, PLUS-OR-MINUS TWO
or
SOME LIMITS ON OUR CAPACITY FOR PROCESSING INFORMATION

George A. Miller

My problem, ladies and gentlemen, is that I have been persecuted by an integer. For seven years this number has followed me around, has intruded in my most private data and has assaulted me from the pages of our most public journals. This number assumes a variety of disguises, being sometimes a little larger

- 5-9 top level menu items?
- 5-9 function types?
- 5-9 colours on screen?

- **Easy to remember**
- **Lacks detail and discrimination**
- **Not clear how to develop further**

1. Using Isolated Ideas from basic science disciplines

2. Applying theories from basic science disciplines

Paired associate theory used understand how to select command names:

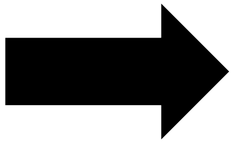
Command names should be **familiar** and have some **natural link** with the invoked process

The approach is specific and allows us to refine our approach by reference to the theory

2. Applying theories from basic science disciplines

Paired associate theory

Command names should be **familiar** and have some **natural link** with the invoked process



Many experiments later

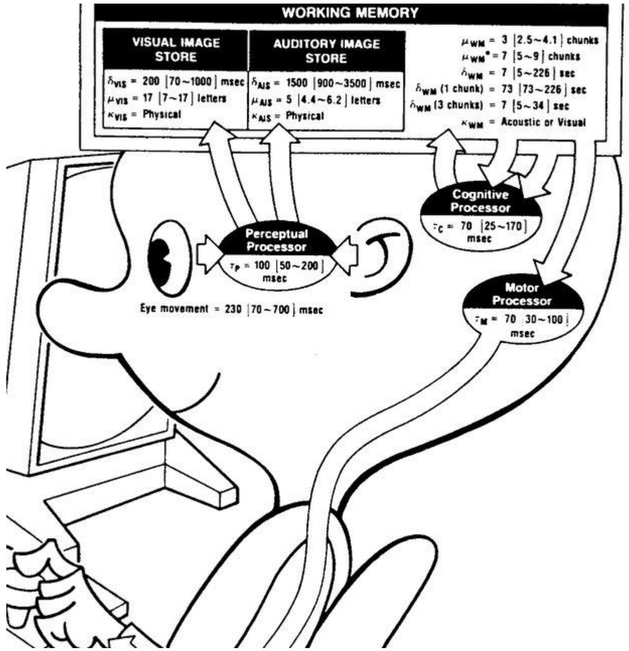
Various factors may affect memorability of command names in different contexts

Neat, generalisable rule for design

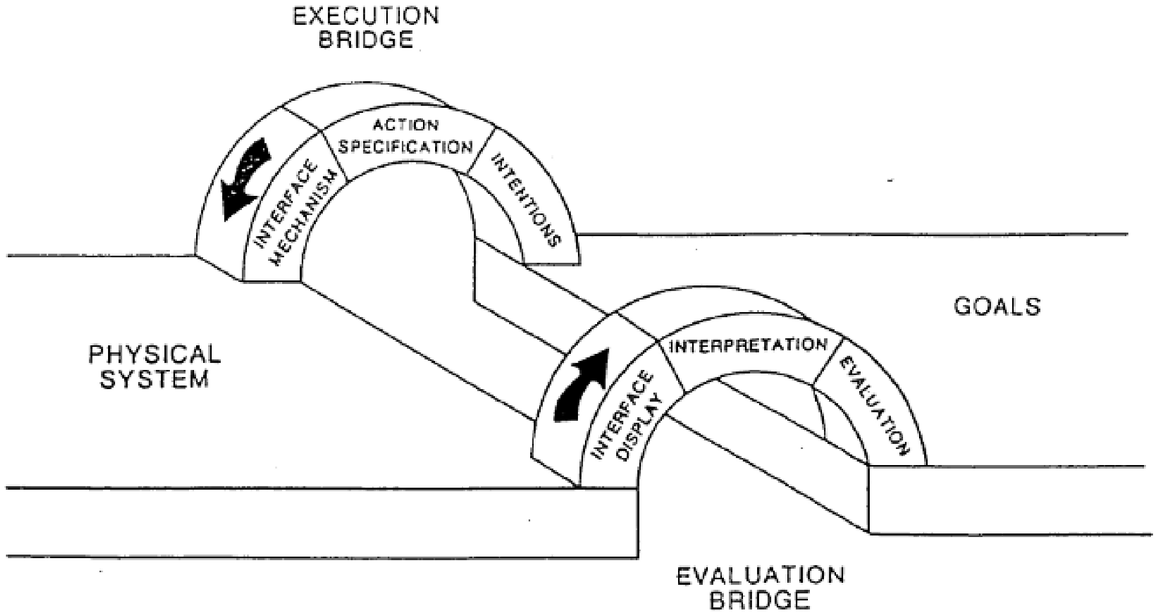
Complex, specific data which is hard to apply

3. Developing new HCI-specific theory, grounded in lab science disciplines

Cognitive modelling of interaction scenarios



GOMS



Gulfs of Execution and Evaluation

Next…

Week 2: The First Wave

Chunk 2: GOMS and Fitts' Law

#HCI _Theory