

HCI as Science

Is HCI a Science? Why or why not?



The Science of Design: Creating the Artificial

Herbert A Simon (1916–2001)

Scholar of economics, computer science, and
cognitive psychology

Emphasized interdisciplinary scholarship



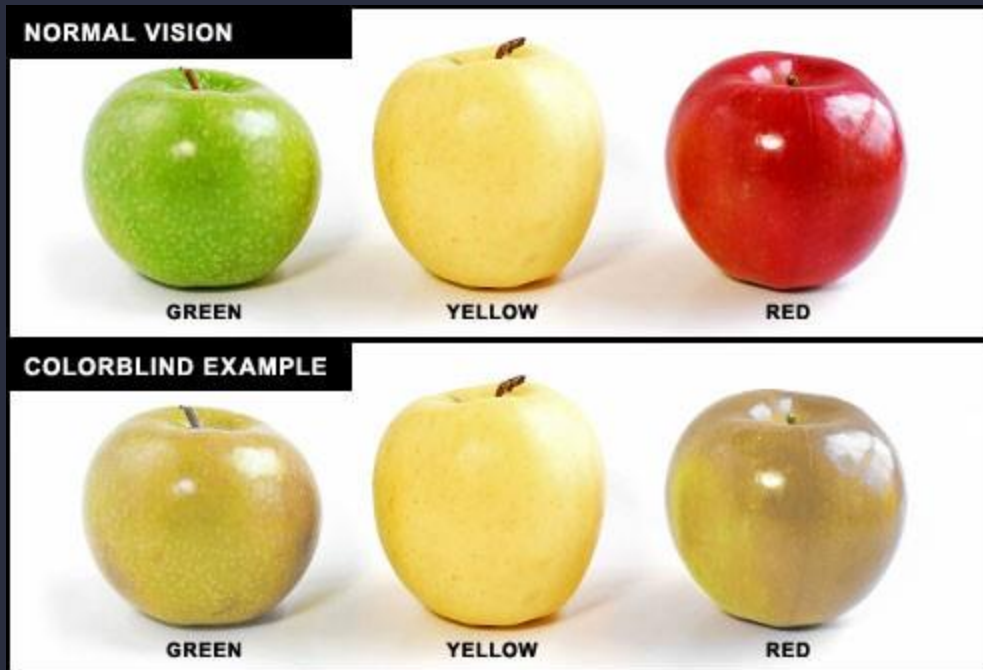
Turing Award 1975



Nobel Prize in Economic 1978

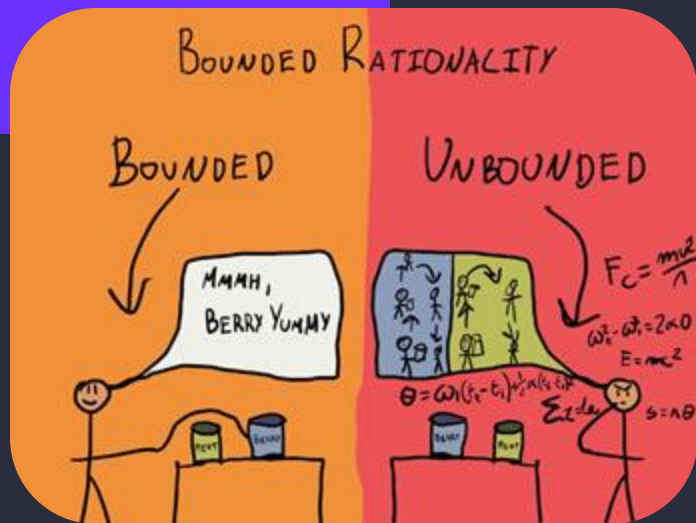


Color blindness greatly influenced his academic life



Introduced “bounded rationality” and “satisficing”

Bounded rationality



Satisficing

Bounded Rationality



Main Argument of Article

**Computer science is design, BUT
design is a science**

**Education for disciplines like
engineering has too much of an
emphasis on natural sciences (ie
math, physics, etc) and should have
more of a liberal arts focus**

Key Takeaways of Article

- 1. **Design is a Scientific Practice
Present in Diverse Disciplines**
- 1. **Problem-Solving is a Matter of
Problem Representation**
- 1. **Design Balances Creativity and
Practicality**

Design is a Scientific Practice Present in Diverse Disciplines

- 1. Design is present in engineering, medicine, architecture, etc
- 1. Motivated by logic
- 1. Works similarly to math problems such optimization problems

Example From Reading: Diet Problem

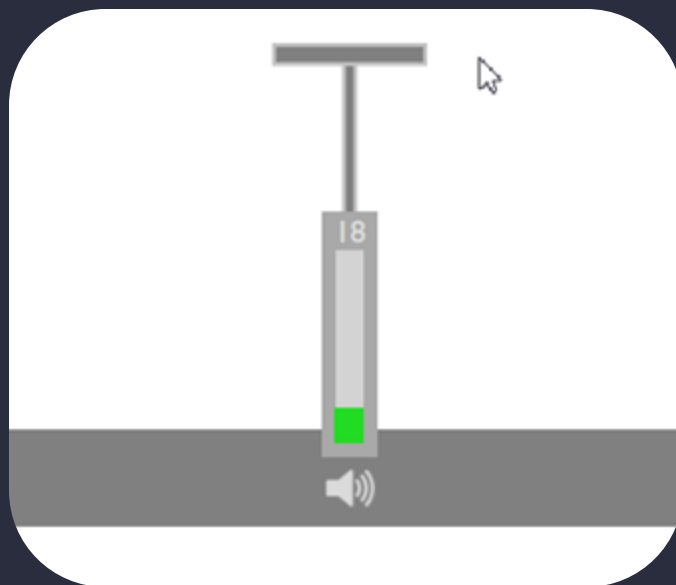
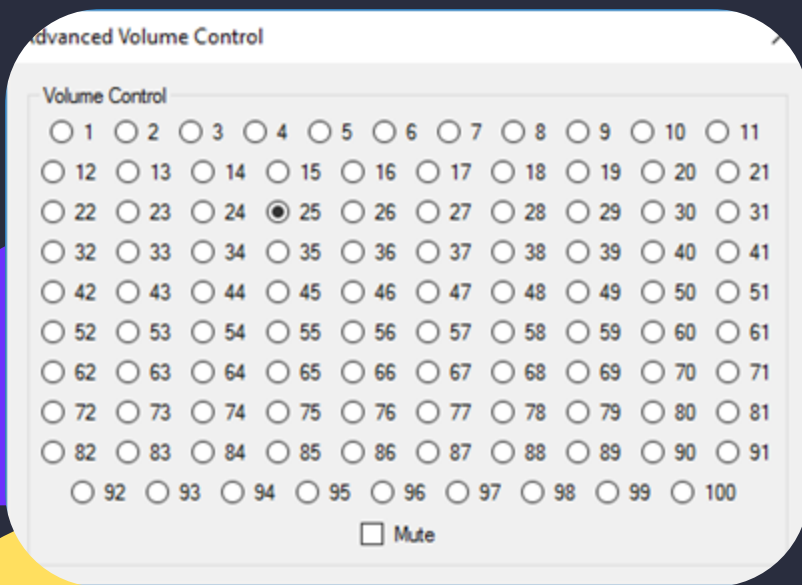


Logical Terms		The diet problem
Command variables	(“Means”)	Quantities of foods
Fixed parameters	(“Laws”)	{ Prices of foods Nutritional contents
Constraints Utility function	(“Ends”)	{ Nutritional requirements — Cost of diet

Problem-Solving is a Matter of Problem Representation

1. To find the solution, how a problem is represented matters a lot
1. Building a house from inside → out vs outside → in produces different results

Example with UI : Designing Volume Control



Design Balances Creativity and Practicality

- 
1. Trying to reach a satisfactory heuristic rather a fully optimal solution
 1. Given real world constraints, designers need to be creative to achieve the most realistic optimal solution

Example : Music Composition

The image displays a musical score for a vocal and piano composition. The score is written in G major and 4/4 time. The tempo is marked "Meno mosso." and the dynamics range from piano (p) to fortissimo (ff). The lyrics are in both German and Russian.

Lyrics:

German: Was thu' ich denn. O Him-mel! Wenn du mich liebst, wenn du wirk-lich so mich liebst, komm her, knie nie - der Theurer

Russian: Что я-а-а-а. Не зна-ю. Если лю-бимь-ты не-на, ско-рѣе ско-рѣе на-ми

Instrumentation:

The score includes a vocal line (Soprano) and a piano accompaniment. The piano part features a Cello (Cel.) and a Violoncello (Vcl.) section. The tempo is marked "Meno mosso." and the dynamics range from piano (p) to fortissimo (ff).

Discussion

How is design a scientific practice when it comes to HCI?

What and who defines a satisfactory heuristic in HCI? Why?



'Another Science is Possible!' A Plea for Slow Science (2018)

Isabelle Stengers:

“the one whose whip is dreaded”

Background:

- Belgian Philosopher, specifically philosophy of science
- Early Career
 - Trained Chemist
 - Worked with chaos theory (branch of mathematics)

Previous Works:

- In Catastrophic Times: Resisting the Coming Barbarism
- Thinking with Whitehead : a free and wild creation of concepts



Fast Science

- Values speed, publication, and completion
- Tied to the market (funding, rankings, & outputs)
- Performs for an industry or audience
- Working in a very rarefield environment (specialization)
- To not care about consequences (GMO exp.)



Slow Science

- Given thoughtful attention, care, and responsibility
- Use theory wisely
- Knowledge is situated, ethical, and collaborative
- Reduce productivity pressure
- Not be in the publicity constantly



An innocuous proposition

"We cannot continuously tell you what our science means; what it will be good for; because we simply don't know yet"

Warm up

- What are some examples of “slow science” and “fast science” in the context of HCI? Why is that?

The Goose that lays Golden Eggs

Goose = Science | Eggs = Knowledge

- Industry should leave Science alone
 - So it can create knowledge
- Not all eggs are golden
 - Not all knowledge produced is necessarily useful to industry (and that is fine)
 - "Knowledge economy" only cares for golden eggs
- Goal: Protect science/research from industrial control



Solution: Reclaiming Science

- Taking back time, care, and imagination
- Science as a responsibility, not just productivity
- Relies on cooperation
- Reflect on the knowledge being produced

Discussion Question

- Would you classify Computer Science research to be too fast? Is it an area dominated by industry needs/interests/funding? Or the opposite?
- In HCI, how might "slowing down" change the way we design or study technology?

Activity:

Discuss how you would approach the following problem using Simon's or Stenger's methodology:

Different applications' voice recognition doesn't work accurately on certain accents

Thank you!

