Informatics 134

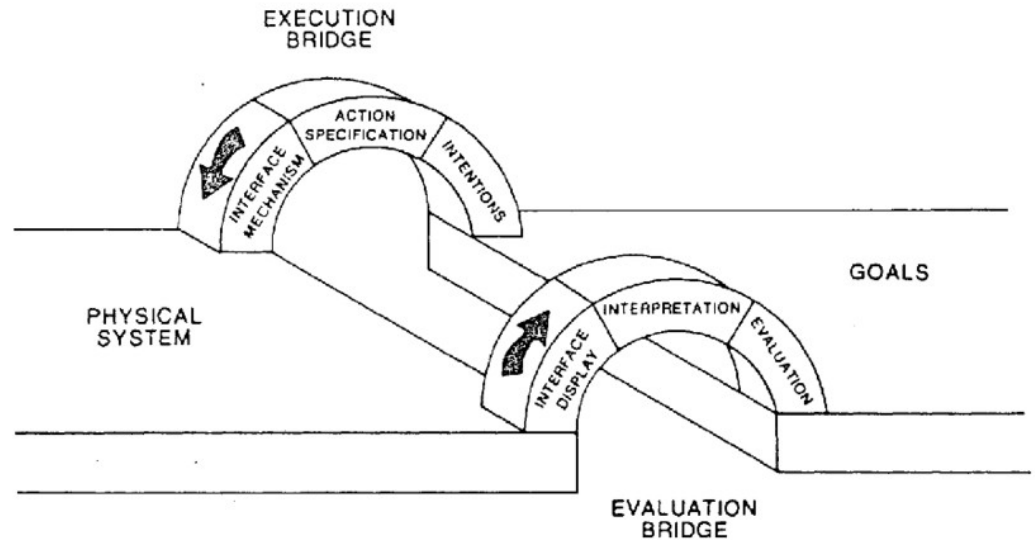Project in User Interaction Software

Let's revisit the gulfs...

The gulf of execution:

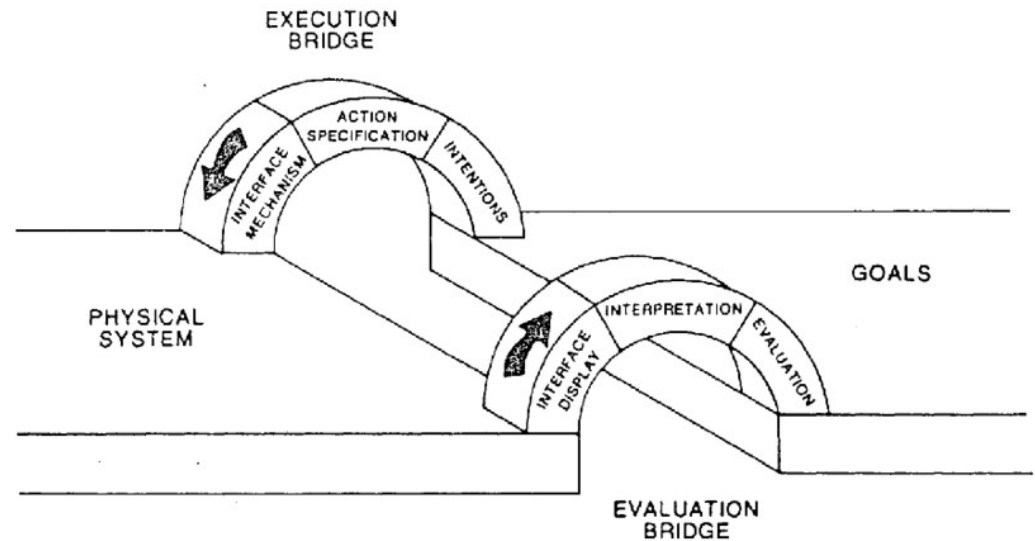The distance between what a user perceives and what a system supports

The gulf of evaluation:

The distance between how a user assesses system state and how well the system supports discovery and interpretation of that state

Software User Interfaces

As software designers and developers, your goal is to narrow the gulfs.

Software User Interfaces

So let's talk about how

There is a amazing body of
work that we can learn from...

10 Usability Heuristics for User Interface Design

Summary: Jakob Nielsen's 10 general principles for interaction design. They are called "heuristics" because they are broad rules of thumb and not specific usability guidelines.

By Jakob Nielsen on Apr. 24, 1994; Updated Nov. 15, 2020

Topics: Heuristic Evaluation, Human Computer Interaction, Web Usability

Share this article:

Jakob Nielsen's general principles for interaction design...

https://www.nngroup.com/articles/ten-usability-heuristics/

Software User Interfaces

Ben Shneiderman's Eight Golden Rules of Interface Design

Ben Shneiderman

UNIVERSITY OF MARYLAND

The Eight Golden Rules of Interface Design

I have often been asked to distill the vast corpus of user interface design into a few key principles. While I was reluctant to do this, it turned out to be a good exercise to write "Golden Rules," that are applicable in most interactive systems. These principles, derived from experience and refined over three decades, require validation and tuning for specific design domains. No list such as this can be complete, but even the original list from 1985, has been well received as a useful guide to students and designers. Jakob Nielsen, Jeff Johnson, and others have expanded these rules and included their variations, which enriches the discussion. Each edition of the book produces some changes. This version is from Section 3.3.4 of the Sixth edition:

Shneiderman, B., Plaisant, C., Cohen, M., Jacobs, S., and Elmqvist, N., Designing the User Interface: Strategies for Effective Human-Computer Interaction: Sixth Edition, Pearson (May 2016) http://www.cs.umd.edu/hcil/DTUI6

https://www.cs.umd.edu/users/ben/goldenrules.html

Bruce Tognazzini's Principles of Interaction Design...

Home | Interaction Design Section | Living Section | About Bruce Tognazzii

First Principles of Interaction Design (Revised & Expanded)

5 Mar 2014 in First Principles, HCI Design, Human Computer Interaction (HCI), Principles of HCI Design, Usability Testing

https://asktog.com/atc/principles-of-interaction-design/

Software User Interfaces

There are many more, but these are the gold standards.

We can distill them down to a few basic principles to follow when we start designing user interfaces.

1. Consistency.

2. Control.

3. Comfort.

4. Cognitive load.

Software User Interfaces

Consistency

- Visual artifacts follow a theme or pattern

- Common behaviors remain the same

- Support user expectations

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02/23/21

Software User Interfaces

Control

- Keep users aware of system state

- Support the transition from novice to expert

- Provide feedback and support error recovery

Software User Interfaces

Comfort

- Avoid clutter, unnecessary UI elements

- Avoid repetition

- Apply clear, understandable terms

- Take advantage of existing metaphors

Software User Interfaces

Cognitive Load

- Strive to reduce cognitive burden

- Support recognition over recall

- "form follows function" (make things work as users expect)
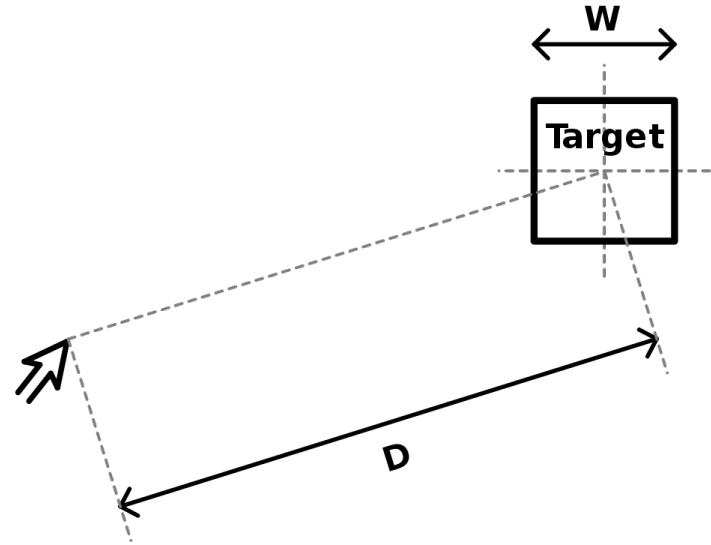
- Avoid overstimulating visual layouts

Software User Interfaces

A few considerations...

Look familiar?

$$MT = a + b \cdot \log_2 \left(\frac{A}{W} + 1 \right)$$

Fitts' law

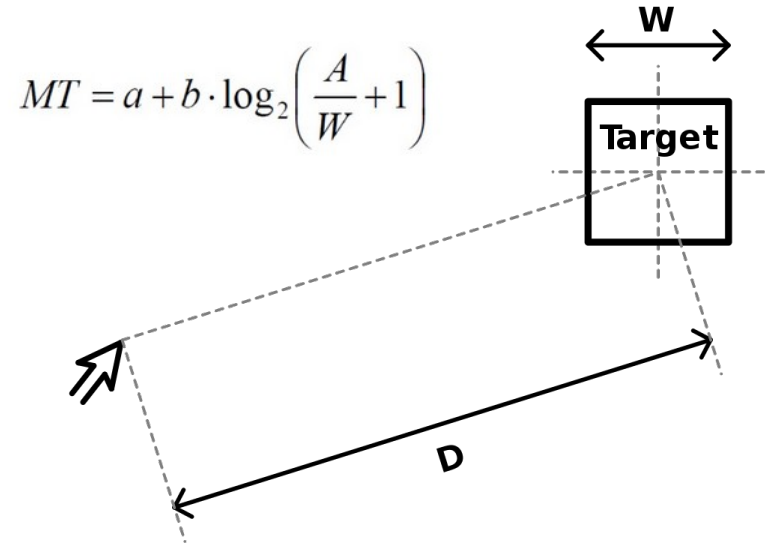$$MT = a + b \cdot \log_2\left(\frac{A}{W} + 1\right)$$

MT - the time it takes to move a pointer to a target

A - the distance of movement

W - the size of the target

a - device specific coefficient (e.g., time for brain to trigger hand to move mouse)

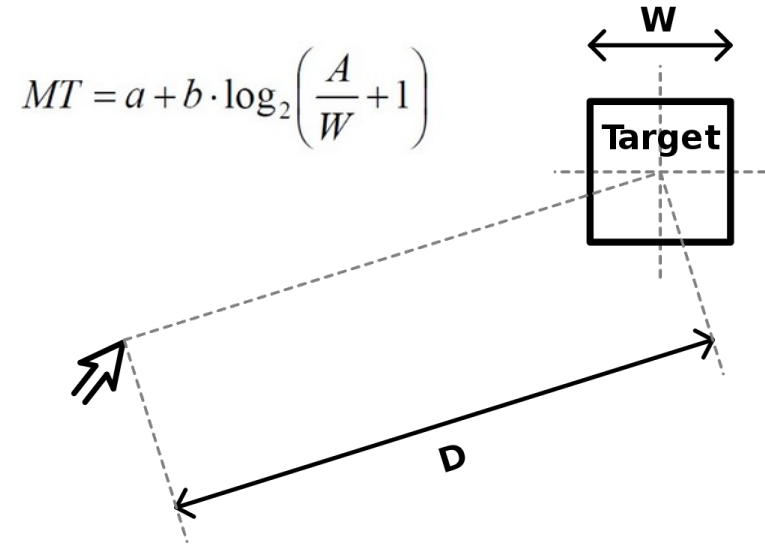b - coefficient for efficiency of movement (e.g., sticky mouse)

Software User Interfaces

Fitts' law

How do we use it?

Fitts' law tells us that the larger the target (W), the faster we will be able to accurately interact with that target.

We can apply this basic principle to user interface design.

$$MT = a + b \cdot \log_2\left(\frac{A}{W} + 1\right)$$

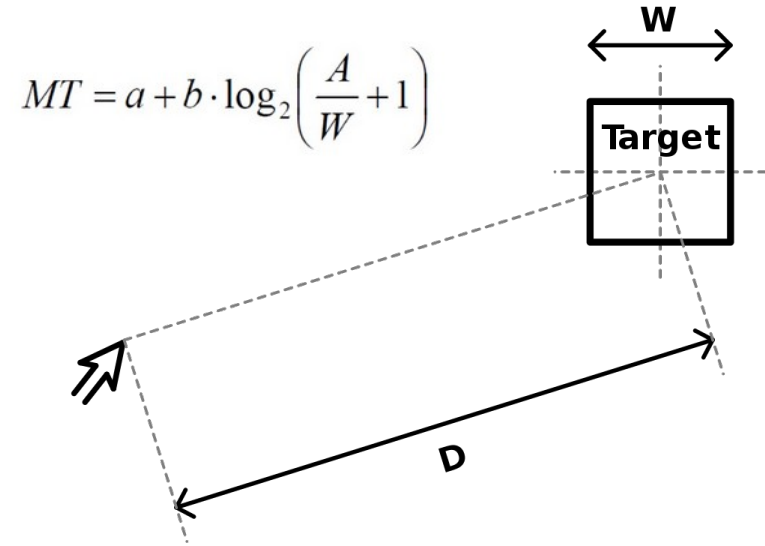UCI Informatics 134 - Mark S. Baldwin

Fitts' law

How do we use it?

The way a user points directly influences the effectiveness of an interface. So…

We can leverage these rules to improve our design:

- Constraint of a screen

- Distance between common widgets

$$MT = a + b \cdot \log_2\left(\frac{A}{W} + 1\right)$$

Software User Interfaces

Fitts' law

Demo

$$MT = a + b \cdot \log_2\left(\frac{A}{W} + 1\right)$$