



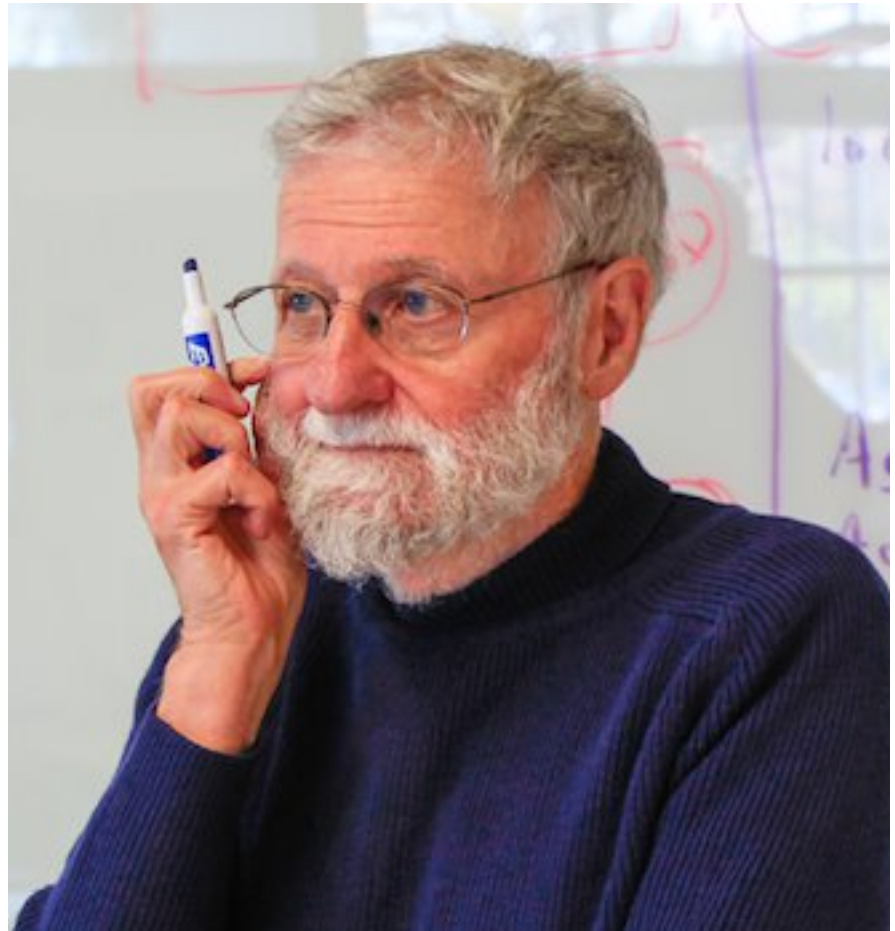
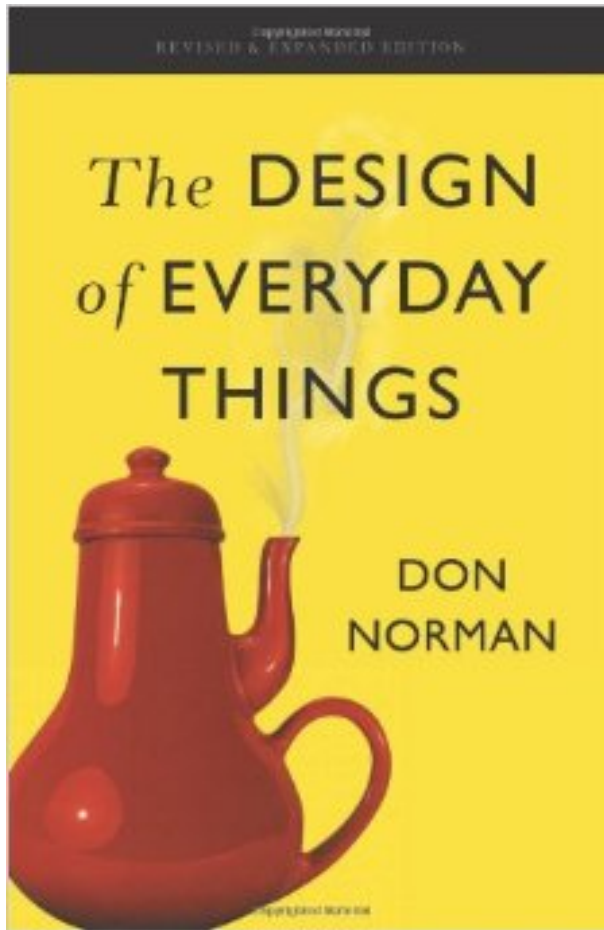
# HCI and Design

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SPRING 2017

# Today's Reading

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# Before we start...

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Join the class slack channel NOW

[tech-hci-2017.slack.com](https://tech-hci-2017.slack.com)

Sign up using your Cornell ID

Please use a reasonable, readable (usable!) name

# Things I learned from Assignment 0

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This is the first HCI course for most of you. 😊

You need practice with core HCI and Design concepts.

# Today: Understanding Users

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Why do we need to understand users?

What do we need to know?

Why do people find it difficult to understand and use so many everyday objects?

What are Don Norman's principles and how do they apply to the design of everyday things?

How can we apply Norman's principles to the design of computer interfaces?

# We need to understand users

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Product success depends on designing systems/tools that can be used

Safely

Effectively

Efficiently

Enjoyably



# We need to understand users

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Bad design results in

- anger and frustration

- decreased productivity in the workplace

- higher error rates

- physical and emotional injury

- equipment damage

- loss of customer loyalty

- costs money

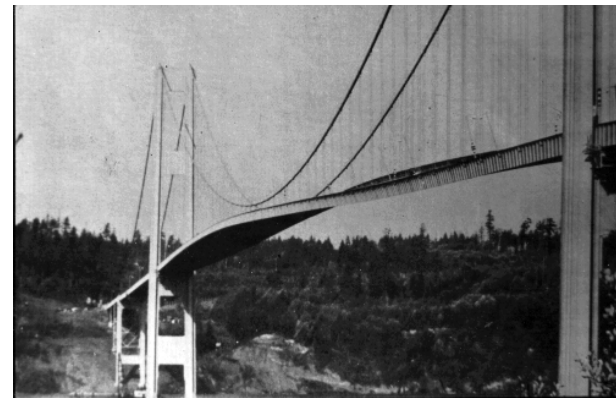
# Why does good design matter?

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Bad artifact  
design



Bad product  
design



Bad  
communication

Dangerous  
design



# Psychopathology of Everyday Things

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We are surrounded by many everyday things that have poor usability:

Door knobs, stoves, showers, taps, ... hardware, software

Many of these things can be difficult to interpret and frustrating to use if they provide no clues or false clues as to how they operate.

# What do we need to know about users?

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Physical & cognitive abilities (& special needs)

Personality & culture

Knowledge & skills

Motivation

## Fatal Mistakes:

Assume all users are alike

Assume all users are like the designer

.... Especially YOU!

# You Are Not the Customer!

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Seems obvious, but...

- You have different experiences

- You have different terminology

- You have different ways of looking at the world

Easy to think of yourself as typical customer

Easy to make wrong assumptions

# We need to understand users

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Product success depends on designing systems/tools that can be used

Safely

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Enjoyably



# Norman's Principles of Design

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Make things visible

Provide a good conceptual model

Affordances

Mapping

Constraints

Feedback

# Visibility

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The correct parts must be visible and they must convey the correct message

Natural signals are naturally interpreted

Visibility problems occur when clues are lacking or exist in excess

Just by looking the user should know

- State of the system

- Possible actions

Don't violate these principles to make something "look good"!

# The well-trodden path

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# Please Push Slowly!

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Wonder why doors are made out of glass?



Evidently someone was smacked...





# The case of the mistaken urinal

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**THIS IS A MOP SINK**

# Good Conceptual Model

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A good conceptual model allows us to predict the effects of our actions

Without a good model we operate blindly

Simply follow rules without understanding a reason

No understanding of cause or effect

No recourse when something breaks



# How do you use this plug?

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# Affordances

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The affordances of an object determine how it can be used

Button affords pushing

Handle affords grasping

Chair affords sitting

Knob affords turning

Just by looking at the object, a person should know how to use it!

# Affordance of this Handle?

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Difficult to get a grip when slippery



# How do you open this drawer?

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# Mapping

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Controls and displays should exploit natural mapping

Natural mapping takes advantage of physical analogies and cultural standards

Physical: Steering wheel

Cultural: red means stop, green means go

# What Knob Goes Where?

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# Exploit Natural Mapping

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# Constraints

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Constraints limit the ways in which something can be used

Constraints can be

Physical

Semantic

Cultural

Logical



# Feedback

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Feedback is sending back to the user information about what action has actually been done

Visibility of the effects of the operation tell you if something worked correctly

Systems should be designed to provide adequate feedback to the users to ensure they know what to do next in their tasks

# Feedback Examples

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Phone button press tones

Rice cooker goes “bing!”

Clicker on your turn signal

Animated icon while waiting for a web page to load



# Norman's Principles of Design

---

Make things visible

Provide a good conceptual model

Affordances

Mapping

Constraints

Feedback

What about software??

# What about Software?

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## Visibility

Visibility of the tasks the interface supports

Communication of system state / mode

## Affordance

If it looks like a button it can be pressed, if it is underlined it can be clicked (web)

## Mapping

Clicking on a particular interface element produces expected effect (e.g., Open should be under File)

# What about Software?

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## Constraints

Constraining search criteria, graying out menu items that don't apply in a particular context

## Feedback

Providing clear and immediate feedback for each action  
Animated icons for any waiting

Many more examples of these that we will see during the semester...

# Larson's dog effect





# Same with Software

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Thank you for registering! We appreciate your business. To activate your software, you will be sent an email key. After you have received the key by email you will be able to [click here](#) and proceed with the activation.

Blah blah blah blah blah blah blah blah blah blah  
blah blah blah blah blah blah blah blah blah  
[click here](#) blah blah blah blah blah blah blah blah  
blah blah blah blah blah blah blah blah blah

# How do we learn about users?

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If there are usability problems in everyday “simple” things, the challenge is much greater for complex software

Problems can be overcome through HCI methods that collect and analyze data to better understand your users

There are many methods, we will learn and practice a few....

- Contextual enquiry

- Surveys

- Interviews

- Usage Analysis

# Activity: Hall of Fame and Shame

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