# **Building User Interfaces** Interaction Design Structure, Layout, & Navigation **Professor Bilge Mutlu**

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## Announcements

- React 1  $\alpha$  and React 1  $\beta$  deadlines extended: *Thursday*  $\rightarrow$  *Sunday*
- Review sandbox code (e.g., CodePen) provided in lectures





## What we will learn today?

- Interaction structure
- Visual layout design
- Principles of navigation

# **Interaction Structure**



# **Information Architecture**

**Definition:** The design of the organizing principle of an interactive system.

A set of structural categories:<sup>1</sup>

- "Show one single thing"
- 2. "Show a list or set of things"
- "Provide tools to create a thing" 3.
- "Facilitate a task" 4.

<sup>1</sup>Tidwell, 2010, *Designing Interfaces* 

## "Show one single thing"

# Focuses on conveying information on a specific topic/facilitating a specific activity



Supports a specific activity, eliminating other distractions.

Includes key components:

- 1. Content of the "single thing"
- 2. Supporting tools that help the user act on the content



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## "Show a list or set of things"

Provides rows or grids of items of the same kind that provide links to components that focus on that item.



Includes design elements that help the user organize and categorize the lists

✓ Can be applied hierarchically

Does this remind you of something we've been discussing?



9

### "Provide tools to create a thing"

Supporting user creation of <u>new content</u>, e.g., a canvas on which to write, draw, paint or structured form for data entry







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Elaine	Benes
	Enter the last name from your Social Security card
Date of birth Why we're asking	ZIP code
09/09/1999	
mm/dd/yyyy	I live outside the U.S.

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"Facilitate a task"

Provides collections of components or controls that help users perform specific actions, e.g., changing a setting

The designer must organize these controls in an effective and logical way



Palm swipe

Direct call

Smart alert

Your phone wil it up after miss messages.

Easy mute On

Swipe to ca

Dual Messe Use two separ

Send SOS n Off Direct share On

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## **Combining Structures**

Any page/component can follow the structure of these components, thus they can be combined to create complex applications

Single-page applications (SPAs) often combine these structures



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# Quiz 1

Complete the Canvas quiz.



# Layout

# Layout

**Definition:** Arrangement of visual elements on a canvas.<sup>2</sup>

- Creating a focal point
- Following the golden ratio 2.
- Using the rule of thirds 3.
- Effectively using grids 4.
- Integrating type 5.
- Placing imagery 6.

- Using negative space 2. Grouping using gestalt theory 8. Creating visual hierarchy 4 Exploiting visual scan patterns 5. Creating contrast/emphasis

<sup>2</sup>These build on the visual design elements/principles that we covered last week.

### **Creating a focal point**

**Definition:** Aka, center of visual interest, where the design directs the attention of the viewer first. after a first

*Pro Tip:* Successful use locks attention to the focal point and gently guides it to its next destination.



## Following the golden proportion<sup>3</sup>

**Definition:** A ratio, 1:1.618, which creates a compositional grid that suggests an asymmetrical, but balanced placement of items on a layout and produces a universal aesthetic appeal.



thesplashlab.com

<sup>3</sup>Further reading on the golden ratio

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## Using the rule of thirds

**Definition:** An approximation of the golden ratio that is easier and more flexible to use. When the canvas is divided into a  $3\times 3$  grid, the intersections serve as focal points.



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## **Effectively using grids**

**Definition:** Grids serve as a visual framework for organizing elements in an orderly and balanced fashion.

Parameters associated with grids: format, aspect ratio, margins, trim size, bleed, live area, column, alley, gutter, and grid.

1) Effectue visual lagent (1) Modularity









### Integrating type

**Definition:** The use of *headlines* or *blocks of text* to guide the user's attention to messages.



I law threader?

# **Placing imagery**

**Definition:** The use of imagery to create a focal point or movement on the canvas.

*Pro Tips:* Place on top, not bottom; direction should be toward next focal point; never flip images; do not interrupt headlines; do not wrap text around images.





TRAIL EINDER

COACHING EVENTS

CHODSE TERRAIN ADD FEATURES FIND PERFECT TRAIL BOOK IN!

## Using negative space

**Definition:** Space left on the canvas from other design elements, used to provide a visual break and create balance.



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### **Grouping using Gestalt Theory**

**Definition**: Visual perception principles that predict how users will perceive design elements.

Includes four key principles:

- Proximity
- Similarity 2.
- Continuity 3.
- Closure 4.



### Similarity

This principle states that objects that share similar visual characteristics; shape, size, colour and so on, create a connection in the viewer's mind implying that they are related or naturally belong together. In the diagram above horizontal lines of the same sized shape appear to be grouped together because alternately they are either solids or outline.

Closure

in the mind of a white square floating above four solid circles, even though there is no square. The principle of closure states that when elements are aligned in such a way that we perceive that the information is connected, we tend to see complete figures even when some of the information is missing.

In this example the effect is created

### Continuity

The gestalt principle at work here is that closure occurs when an object is incomplete or a space is not entirely enclosed. Provided enough of the shape is indicated, we perceive the object as whole by filling in the information that is absent, thus completing the circle.

### Proximity

Proximity occurs when objects or elements are placed close together. They tend to be perceived as a group or a unified whole. In the example above, the vertical lines of dots that are closer together appear to be more related to each other or are understood as a single unit, separate from the single line of dots on the left.

## **Creating visual hierarchy**

**Definition**: Using relative positioning and sizing to communicate what design elements are more important and should be looked at first.



# You will read this first. 🗸

## Then you will read this.

And then this one.



### **Exploiting visual scan patterns**

**Definition:** Designing layouts that exploit common eye-scanning patterns, e.g., the Fpattern and the Z-pattern.





Popular Outfits

### About Us

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### Our Designers

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**Life**Lock

Identity theft is more than credit card fraud. Free credit services don't look for threats like a criminal draining your 401(k), renting an apartment or committing crimes in your name. Our Advantage and Ultimate Plus memberships will. We detect a wide range of threats and war fix identity theft issues

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START MEMBER

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### How LifeLock work to help protect you from identity theft.

Our proprietary technology alerts you to wide range of ider have an identity theft problem, our U.S.-based team of specialis



### DETECT & ALERT

We can detect a wide range of threats and will alert you by phone," email and text of the suspicious activity."



### RESTORE

If you become a victim of identity theft while a LifeLock member, a dedicated U.S.-based Identity Restoration Specialist will work with you from start to finish to help fix the issue. With our \$1M Service Guarantee<sup>1</sup>, we'll spend up to \$1M on lawyers and experts if needed.



### REIMBURSE

If you have money stolen due to identity theft, we'll replace it, as

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# **Creating contrast and emphasis**<sup>4</sup>

**Definition:** Using contrast and emphasis to establish visual hierarchy by manipulating features of design elements, including position, size, color, typographic characteristics.

Contract Trac	Facture 1	Facture 2
Contrast Type	Feature 1	Feature 2
Spatial contrast	Filled space	Empty space
	High density	Low density
Layout contrast	Тор	Bottom
	High	Low
	Right	Left
	Isolated	Grouped
	Symmetrical	Asymmetrical
Form contrast	Simple 刈	Complex 🔧
FT (Da)	Representational	Abstract
	Geometric	Organic
	Angled	Curved
Direction contrast	Vertical	Horizontal
	Static	Moving
Style contrast	Technical and precise	Hand-drawn and irregular
	Playful	Serious
Size	Large	Small
	Long	Short
	Wide	Narrow
Color contrast	Dark	Light
	Black and white	Colorful
	Warm colors	Cool colors
	Vivid	Muted
Texture contrast	Fine	Coarse
	2 Smooth	Rough
Typographic contrast	Serif	Sans serf
	Roman style (regular)	Bold style

<sup>4</sup>Golombisky & Hagen, 2010, *White space is not your enemy* 



Complete the Canvas quiz.



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# In-Class Activity 1: Layout Deconstruction

### **Cheatsheet:**

Creating a focal point Following the golden ratio Using the rule of thirds Effectively using grids Integrating type Placing imagery Using negative space Grouping using gestalt theory Creating visual hierarchy Exploiting visual scan patterns Creating contrast/emphasis



# **Principles of Navigation**

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# **Principles of Navigation<sup>5</sup>**

- 1. Wayfinding
- 2. Cost
- 3. Aids
- 4. Models



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# Wayfinding

**Definition**: User behavior where navigation across components follows a particular workflow or supports user goals.

Three key elements:

- Labels & signage \ood With W Navigation <u>clues & aids</u> Maps, *e.g.*, site maps Jobe 2.
- 3.







### SITEMAP



Monki H&M HOME & Other Stories ARKET Afound

### Career

Grow with us

Be yourself

Enjoy our culture

More about our values

Be proud

Lead the way

Randall April, H&M Andreas Sjunnesson, Weekday Anna Norling, Cheap Monday Michael Hafner, Monki Sofia Carpentier, & Other Stories Helene Fredell, H&M Home

Stylish rewards H&M Incentive Program Find your career with us

### Sustainability

Vision and strategy Sustainability strategy Stakeholder engagemen Animal welfare Chemicals Climate positive value cha Water Business ethics **Get involved** Care for your clothes Recycle your clothes Sustainability Summary 201

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Financial calendar Reports and presentations The H&M group 2017 in wor pictures Capital Markets Day 2018 The share Shareholders Dividend Five year summary Subscribe

### Media

Newsroom Image galleries Caler**37** Social media Media contacts **Definition:** The time and effort required by users to navigate between components.

Two key principles:

- Minimize factors that increase cost of navigation: *context switch*, *errors*, 1. *delays* <
- Minimize travel time by minimizing number of steps and context switches 2.

# Aids



**Definition:** Design elements that aid users in navigating through content.

Three types of navigation aids:

- 1. Global navigation aids, *e.g.*, menus, tabs, sidebars
- 2. Utility navigation aids, e.g., settings pane
- 3. Associative/in-line navigation aids, *e.g.*, related links



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Complete the Canvas quiz.



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## **Models**

**Definition:** Commonly used patterns of navigation through interactive applications.

- Hub and spoke 1.
- Fully connected 2.
- Multi-level 3.
- Stepwise 4.
- Pyramid 5.

- Pan-and-zoom ĺD.
- 2. Flat navigation
- Modal panel 3.
- Clear entry points 4.
- 5. Bookmarks
- Escape hatch 6.

Models: Hub & spoke

**Definition:** Involves a central hub, e.g., a home screen, that provides transitions to and from several specialized components.



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### **Models: Fully connected**

**Definition:** A central component/page is connected to all other components that are also linked to each other.



### **Models: Multi-level**

**Definition:** Involves main components that are fully connected with each other and subcomponents that are only connected among themselves.



### **Models: Stepwise**

**Definition:** Follows a sequential or branching navigation that represents step-by-step process, e.g., checking out on an e-commerce site.



1	2	3	4	
Seller agreement	Seller Information	Billing / Deposit	Tax information	

### Set up your Amazon selling account

Have the following available:



Legal name What is a legal name? •

### Seller agreement

I have read and accepted the terms and conditions of the Amazon Services Business Solutions Agreement



### Please Leave Feedback

### **Models: Pyramid**

**Definition:** Similar to the stepwise model, but at each step, the user can navigate to the hub and back.



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### **Models: Pan-and-zoom**

**Definition:** Provides users with the ability to continuously navigate across a large space of content, e.g., a map, a list, or a written document.





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### **Models: Flat navigation**

**Definition:** Involves a central workspace that is always visible and functions that do not require context switches or navigation.





### Models: Modal panel

**Definition:** Follows the flat navigation model except for modal dialogs that are temporarily overlaid on them ain canvas to help the user perform specific functions.





### **Models: Clear entry points**

**Definition:** Complex applications involve navigational models with clear entry points that guide the user to frequentyly used or temporary functions without having to go through the hierarchical structure or a stepby-step process.







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### **Models: Bookmarks**

**Definition**: Bookmarks allow frequent or infrequent users to directly access particular functions without having to navigate through hierrachical structures.



what will Doran do? What will his brother do to avenge our murdered prince?" She moved closer to the captain "And you say, he does not

wish to be a 💦 👩 "He do

a

<u>\_</u>

otah said again.

The captain of guards knew the prince he guarded. Once, long ago, a callow youth had come from Norvos, a big broad-shouldered boy with a mop of dark hair. That hair was white now, and his body bore the scars of many battles... but his strength remained, and he kept his longaxe sharp, as the bearded priests had taught him. She shall not pass, he told himself, and said, "The prince is watching the children at their play. He is *never* to be disturbed when he is watching the children at their play."

"Hotah," said Obara Sand, "you will remove yourself from my path, else I shall take that longaxe and—"

"Captain," came the command, from behind. "Let her pass. I will speak with her." The prince's voice was hoarse.

Areo Hotah jerked his longaxe upright and stepped to one side. Obara gave him a lingering last look and strode past, the maester hurrying at her heels. Caleotte was no more than five feet tall and bald as an egg. His face was so smooth and fat that it was hard to tell his age, but he had been here before the captain, had even served the She snorted. "It has been twenty years, or near enough to make no matter. And I was not here long. I

Obara touched her whip.

hanged

upon her hips.





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### Models: Escape hatch

**Definition:** An "escpape hatch" provides users with the ability to go back to the main component/page in a complex structure without having the trail steps back.







Just the right amount of everything.

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# **In-Class Activity 2: Reverse Engineering Navigation Models**





### Prep for college for less Explore more





**Room Hacks** 





Women's Fashion





Men's Fashion

# **Principles of Navigation**

- 1. Wayfinding
- 2. Cost
- 3. Aids
- 4. Models



Complete the Canvas quiz.



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## What did we learn today?

- Interaction structure
- Visual layout design
- Principles of navigation