No screens

Prof. Lydia Chilton
COMS 4170
6 February 2019
Last time on COMS 4170....
What is this color model called?

RGB
What color will you get?

If you have have
Red: 100%
Green: 100%
Blue: 100%

White
What color will you get?

If you have have
Red: 50%
Green: 50%
Blue: 50%

Grey
What color will you get?

If you have have
Red: **50%**
Green: **50%**
Blue: **50%**

Grey

If you have have
Red: **20%**
Green: **20%**
Blue: **20%**

Darker Grey
What’s good about these fonts together?

Contrasting fonts:
San serif + serif
What should you not do?

Conflicting fonts:
serif + serif
What’s another good way to mix fonts?

Concordant fonts:
Gill Sans + Gill Sans MT
Which of these is easier to follow?

Continuity
Our minds perceive lines and curves as continuing on their trajectory
User Interaction Models

No screens

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Goal 1

Build websites that suit the needs and abilities of users

1. Display information
What’s the point of this website?

Users interact with the system to accomplish a goal.
Goal 1
Build websites that suit the needs and abilities of users

1. Display information

2. Design interactions that allow users to accomplish a goal
Goal: Buy a book

Subgoal: Search for book

Interaction: Type its name, click on the image of it
Goal: Buy a book
Subgoal: Add to cart
Interaction: Click “Add to cart” button
Goal: Buy a book
Subgoal: Checkout
Interaction: Click “Proceed to checkout” button
Goal: Buy a book
Subgoal: Enter payment information
Interaction: Click, type, move cursor, click “Continue”
Goal: Buy a book

Subgoal: If information is correct, place order

Interaction: Click “place your order”
The designer must know the users’ goals create the subgoals and interactions to meet it.

**Goal:** Buy a book

**Subgoal:**

**Interaction:**

- **Find it:** Type, click
- **Add to cart:** click
- **Enter payment info:** Type, click, point
- **Place order:** Click
The designer must know the users’ goals create the subgoals and interactions to meet it.

But sometimes on Amazon, I don’t have a goal.

I’m just browsing.
Are these sites “just for browsing”?

No. Although people do browse, sites are primarily designed to accomplish a goal. Browsing is secondary.
The designer must know the users goals and help them accomplish it.
Low-level Interactions
What are interactions on this page?

Move
Click
Type
Interaction: Moving + Clicking
Which button is faster to click?
Which button is faster to click?

A

B
Which button is faster to click?
Fitts’s Law

Time to move your pointer to a target

\[ \text{Time} = a + b \times \log \left( \frac{2D}{S} \right) \]

where:
- \( D \) is the distance between the start and target positions.
- \( S \) is the width of the target.
- \( a \) and \( b \) are constants.
Using Fitts’ law, why is A faster to click?

\[ a + b \log \left( \frac{2D}{S} \right) \]

S is bigger. Thus the time is lower.
Using Fitts’ law, why is A faster to click?

\[ \text{time} = a + b \times \log \left( \frac{2D}{S} \right) \]

D is small. Thus the time is lower.
Using Fitts’ law, why is B faster to click?

\[ \text{Time} = a + b \cdot \log \left( \frac{2D}{S} \right) \]

S is bigger (infinite). Thus the time is lower.
Why did iOS move the menu for applications?
Fitts’s Law: What are $a$ and $b$?

\[
time = a + b \cdot \log \left( \frac{2D}{s} \right)
\]
Time to move the pointer: Fitts’s Law

Time to move your pointer to a target

$$= a + b \times \log \left( \frac{2D}{S} \right)$$

Buttons on the edges are fast to get to because they have infinite size.
More moving + clicking:
Tunneling Menus
More moving + clicking: Cascading Tunnel Menus
More moving + clicking:
Cascading Tunnel Menus fix
What are all the low-level interactions are needed to accomplish this subgoal?
Every interaction takes time and effort, and is a potential source of error.
How could you improve this?
Low-level Interactions take time and effort. Minimize them because you do them a lot.
The Interaction Loop
Establish a goal: Buy a book.
What happens after you place an order?

To accomplish a goal, users must **execute** an operation and **evaluate** the result.
The Seven Stages of Action

1. Form the goal
2. Plan the action
3. Specify the action sequence
4. Perform the action sequence
5. Perceive the state of the world
6. Interpret the perception
7. Compare the outcome with the goal
Goal Execution Step 1:
Plan the action
Specify the action sequence
Perform the action sequence
Goal Execution Step 2:

Plan the action

Specify the action sequence

Perform the action sequence
Goal Execution Step 3:
Plan the action
Specify the action sequence
Perform the action sequence
Goal Evaluation Step 1: Perceive the State of the world
Goal Evaluation Step 2: Interpret the perception
Goal Evaluation Step 3: Compare the outcome with the goal
What does The 7 Stages of Action remind you of?
What’s the users goal?     Post a tweet
What does the execute?

Put cursor in box
Type message
Move mouse to button and click
What does the user evaluate?

Did it get posted?

Lydia Chilton
Knicks vs. Celtics tonight!
How does the user know?

It’s my face.

It’s my text.

It has new options.
Goal: Perfect DDR score.

What’s the users subgoal? Step on the correct arrow at the correct time.
Execution 1: How does the user plan the action?

Look at the screen to see the correct arrow/timing.
Execution 2&3: How does the user execute the action?

Lift your foot, move over arrow, Place it at the right time
Evaluation: How does the user evaluate the action?

You can see the arrow flash. It tells you a grade.
What’s the users goal?  
To set the alarm for 9:07am
Move the wheel to the time
Switch it to “on”
Evaluation?

Turns to an alarm screen
Next time:

Programming interactions in JavaScript?

**HTML**

```html
<body>
  <button id="counter" class="btn btn-primary">Counter (0)</button>
</body>
```

**JavaScript**

```javascript
$(document).ready(function(){
  "#counter" .click(function(){
    alert("foo")
  })
})
```
Summary
Users interact with the system to accomplish a goal.
The designer must create the subgoals and interactions to help them accomplish it.

**Goal:** Buy a book

**Subgoal:** Find it

**Interaction:** Type, click

**Add to cart**

**Enter payment info**

**Place order**

Click
Time to move to a target: Fitts’s Law

Time to move your pointer to a target

\[ T = a + b \cdot \log \left( \frac{2D}{S} \right) \]

Buttons on the edges are fast to get to because they have infinite size.
Low-level interactions take time and effort. Minimize them because you do them a lot.
Know the users’ goals and design interactions as: **execution** and **evaluation**

### Execution
- Plan the action
- Specify the action sequence
- Perform the action sequence

### Evaluation
- Perceive the state of the world
- Interpret the perception
- Compare the outcome with the goal