Design for Engineers

Tony Poor
MIT 6.470 — Palantir Technologies
What is design?
Design bridges the gap between what a thing is and why it exists.

Sahil Lavingia
Designer at Pinterest, Gumroad
But I’m an engineer.
Our schedule for today…

1. PROCESS
2. INTERACTION DESIGN
3. VISUAL DESIGN
1

PROCESS
Think

Check

Make
Think

Check

Make

USERS
Who are you designing for? **Go talk to them.**

Think

Make

Check
Why do you play Turbo Hearts?
How often do you play?
How do you keep score?
Is anyone better than you? Worse? How can they get better?
Most of all, just observe. Figure out what their goals are. Probe into why they do things, and think like you’re their apprentice.
Come up with divergent ideas to help your users achieve their goals. **Sketch.**
**Turbo Hearts Score Tracker**

- Track your score, improve your game.
- Start Tracking!
- View other player profiles. Search for friends who may have passed your scores already.
- Search for a player.

**Recent Games**
- 12/21 Dan -5 Todd 12 EA 30 534
- 12/20 Todd 5 Dan 7 EA 20 EA 25
- 12/17 Qw 20 Todd 22 AEA 20 EA 64

**Recent Tips**
- Dan - don't fool with the Queen. It gives everyone too much information.
- Todd to Allen - try to run more.
- Allen - any tips on how to land.
- Dan - if you have more than 3 cards of a suit you have a good chance of taking everything.

Username: [Input]
Password: [Input]
Show your ideas to your users. If you have a prototype (even just on paper), watch them use it.
Turbo Hearts Score Tracker

Track your score, improve your game.

Start Tracking!

View other player profiles, search for friends who may have posted your scores already.

Recent Games
- 12/21 Dan -5 Todd 12 E1 30 G 34
- 12/20 Todd 5 Dan 7 AB 20 EA 85
- 12/17 AB 20 Todd 72 AB 20 EA 64

Recent Tips
- Dan - don't bed with the Queen, it gives everyone too much information.
- Todd to Allen - try to run more.
- Allen - Any tips on how? Day - if you have more than 7 cards of a suit you have a good chance of taking everything.

Register or log in to reply.
Logged in as Jon Chu
Go to Dashboard
Log out

Recent Tips
Dan - don't load with the gun, it gives everyone too much information.

Write a comment

League

Defeatable league only view

Recent Games
New game: [space for new game details]
12/15 Todd: 17 Allen: 20 Jon: 22 [space for scores]
12/10 Dan: 5 Todd: 22 FA: 23 [space for scores]

Post tip

Post tip

Post tip

Jon Chu edit profile

Turbo Hearts Score Tracker
Make sure they know you’re testing the interface, not them. Ask them to **think aloud** as they go.

“What do you expect to see when you click on that?”

“What do you see on this page?”

If they ask you a question, reverse it.
Were there any problems? Did we learn anything new about our users? What could we improve?

Think

Check

Make
Iterate on your designs, while increasing in fidelity...
...and keep showing them to users, seeing how easy to use/valuable they are.
INTERACTION DESIGN
**Interaction Design**

**Seven Stages of Action**

- Form a goal
- Translate goal into task(s)
- Plan action sequence
- Execute the action
- Interpret the state of the system
- Evaluate the outcome
- Perceive the state of the system
 Interaction Design

Seven Stages of Action

Gulf of Execution

Form a goal

Translate goal into task(s)

Plan action sequence

Execute the action

Evaluate the outcome

Interpret the state of the system

Perceive the state of the system

System
**Interaction Design**

**Seven Stages of Action**

1. Form a goal
2. Translate goal into task(s)
3. Plan action sequence
4. Execute the action
5. Evaluate the outcome
6. Interpret the state of the system
7. Perceive the state of the system

**Gulf of Execution**

**Gulf of Evaluation**
Interaction Design

Feedback

You can overcome the gulf of evaluation partially by giving feedback quickly.
Interaction Design

Feedback

Activity Indicator

Progress Bar (>5 secs)
Interaction Design

Perceived Affordances

A cue baked into an object that signifies how it may be used.
Perceived Affordances
Perceived Affordances
Interaction Design

Proximity

Put controls next to the things that they modify.
Give MIT Presentation

- Assignee: Tony Poor
- Projects: Today
- Followers: Tony P
- Activity Feed:
  - Tony Poor created task. 3:24pm
  - Tony Poor marked today. 3:24pm
Give MIT Presentation

Assignee: Tony Poor

Projects: add to project

Followers: Tony P

Activity Feed:
Tony Poor created task. 3:24pm
Tony Poor marked today. 3:24pm
Interaction Design

Error Prevention

Are you sure you want to permanently delete this folder?

[Cancel]  [Delete Folder]
So **do, don’t ask** — just allow actions to be reversed. **Undo is awesome.**
Interaction Design

Modes

Mode errors can occur when the same action can have different results, depending on the state of the system.
Interaction Design

Modes
Quasimodes require the user to maintain some action.
Interaction Design

Modes

Quasimodes require the user to maintain some action.
Interaction Design

Modes

Some tips:
Try to avoid modality if you can.
Make mode state clear and visible.
Consider quasimodes.
Fitts’s Law

\[ T = a + b \log_2(1 + \frac{D}{W}) \]

Time \quad \text{Constants} \quad \text{Distance} \quad \text{Target Width}

Make your targets bigger. (raise W)
Decrease distance to targets. (lower D)
Fitts’s Law
Interaction Design

Fitts’s Law
Hick’s Law

\[ T = a + b \log_2(n + 1) \]

- Time
- Constants
- # of Options
VISUAL DESIGN
Visual Design

Grids

Line stuff up!
Which is harder to process?

Adobe Lightroom

MS Expression Blend
Which is harder to process?

Adobe Lightroom

MS Expression Blend
# January 2013

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**Melhattan**

Happy new year everyone! Let's start things out Down Under, where friend and illustrator Oslo Davis, one of my favorite artists, has put together "Melhattan," a wonderful, animated valentine to his native city of Melbourne. The artwork is distinctly his own, but the short film is “part homage, part pastiche of the opening sequence of Woody Allen's seminal 1979 film ‘Manhattan.’” complete with a Gershwin-esque soundtrack. Here are a few select stills.
Happy new year everyone! Let's start things out Down Under, where friend and illustrator Oslo Davis, one of my favorite artists, has put together "Melibhattan," a wonderful, animated valentine to his native city of Melbourne. The artwork is distinctly his own, but the short film is "part homage, part pastiche of the opening sequence of Woody Allen’s seminal ‘79 film Manhattan," complete with a Gershwin-esque soundtrack. Here are a few select stills.
Visual Design

Grids

Some CSS frameworks for grids (even responsive ones):

960 Grid System  http://www.960.gs
Typography

Choose a typeface that honors your content.

Best resource for web fonts: Typekit (typekit.com) (Google Web Fonts is okay, but average quality is lower)

Try to limit to 1–2 typefaces, and if you don’t know where to start, browse “Recommended for Paragraphs” on Typekit.
One way to pair typefaces is to look for two that are similar structurally, but different in one or two major ways.

This article has some great tips:
http://blog.typekit.com/2012/05/23/type-study-pairing-typefaces/
Keep line length manageable.

The house stood on a slight rise just on the edge of the village. It stood on its own and looked over a broad spread of West Country farmland. Not a remarkable house by any means—it was about thirty years old, squattish, squarish, made of brick, and had four windows set in the front of a size and proportion which more or less exactly failed to please the eye.

too long!
Typography Tip #1
Keep line length manageable.

The house stood on a slight rise just on the edge of the village. It stood on its own and looked over a broad spread of West Country farmland. Not a remarkable house by any means—it was about thirty years old, squattish, squarish, made of too short!
Typography Tip #1
Keep line length manageable.

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A good rule of thumb: 45–75 characters. (66 is ideal.)
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Typography Tip #2
Choose an appropriate line height ("leading").

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and proportion which more or less exactly failed to
please the eye.

**line-height: 1.2** is the standard, but tweak if you need to.
Typography Tip #3

Use smart quotes!

&#34;  &#39;  &#39;  &#34;

&ldquo;  &lsquo;  &rsquo;  &rdquo;

dumb quotes
Visual Design

Color
Color exploration resources:

Adobe Kuler  kuler.adobe.com
Colourlovers  colourlovers.com
Color Tip #1

Limit your color palette.
Color Tip #2

Use high contrast to draw attention and low contrast for less important elements.
Color Tip #2

Use high contrast to draw attention and low contrast for less important elements.

far like the present period, that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only.

There were a king with a large jaw and a queen with a plain face, on the throne of England; there were a king with a large jaw and a queen with a fair face, on the throne of France. In both countries it was clearer than crystal to the lords of the State preserves of loaves and fishes, that things in general were settled for ever.

It was the year of Our Lord one thousand seven hundred and seventy-five. Spiritual revelations were conceded to England at that favoured period, as at this. Mrs Southcott had recently attained her five-and-twentieth blessed birthday, of whom a prophetc private in the Life Guards had heralded the sublime event, as occurring little or no more than a week before the
Try not to use pure black on pure white (or vice versa).

It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to Heaven, we were all going direct the other way—in short, the period was so far like the present period, that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only.
Color Tip #3

Try not to use pure black on pure white (or vice versa).

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Color Tip #3

Try not to use pure black on pure white (or vice versa).

#252525
#888888
Color Tip #4

Be aware of color blindness.
Color Tip #4

Be aware of color blindness.
Iconography

Icons can aid recognition vs. recall and make information more digestible.
Iconography

Icons can aid recognition vs. recall and make information more digestible.

...but avoid relying solely on them when you can.
...the more honest, truthful answer to pretty much any question on web design and usability [is] *it depends.*

Jeremy Keith
Author of HTML5 for Web Designers
Q&A

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