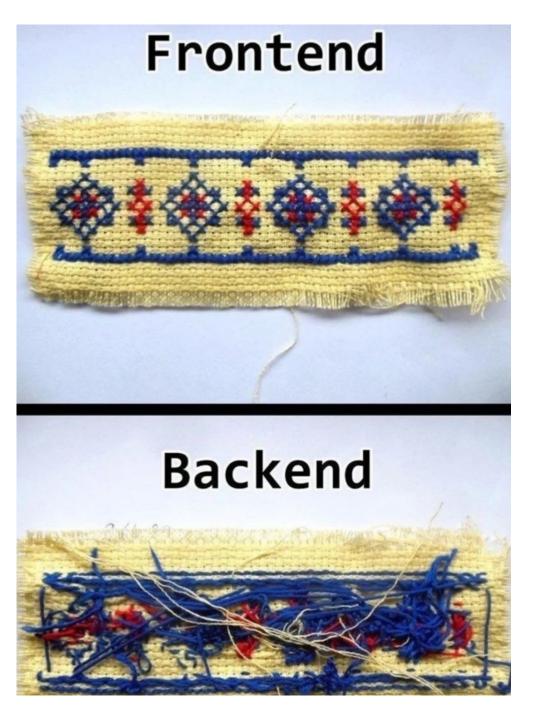
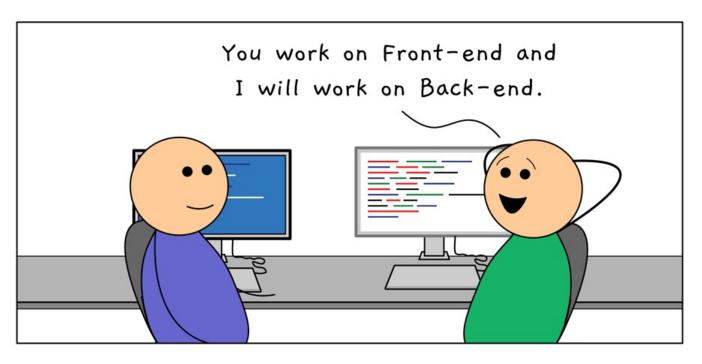
# ECE444: Software Engineering

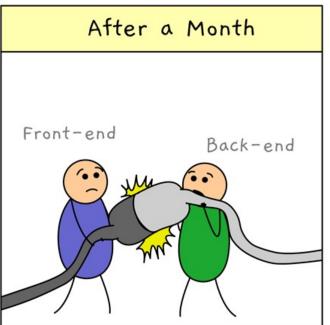
### Prototyping, Measurement, TDD

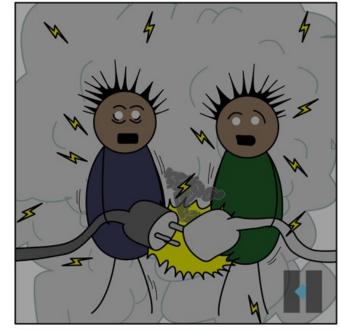
#### Shurui Zhou











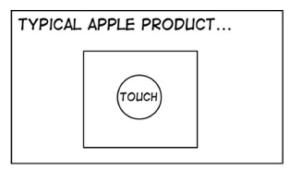
# Prototypes, Mockups

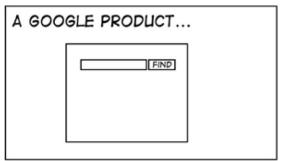


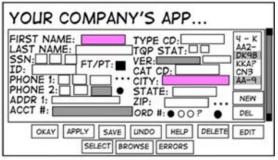
#### Product Requirement Document (PRD)

- 1. Goals
- 2. User Personas
- 3. User Stories
- 4. Functional Requirements
- 5. Non-Functional Requirements
- 6. User interaction and design
- 7. Questions
- 8. Out of Scope

#### How should the product look?



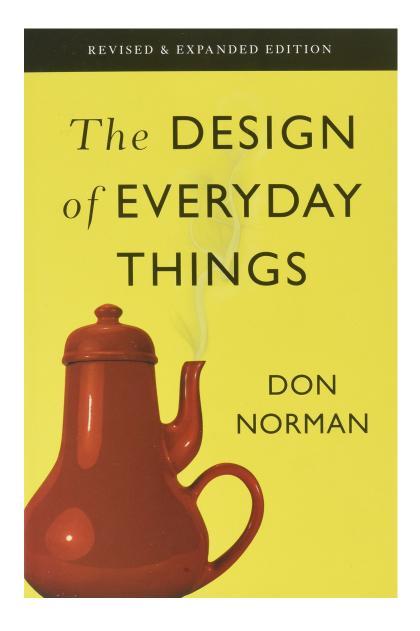


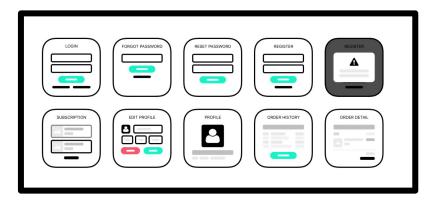


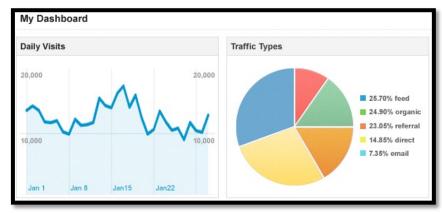
STUFFTHATHAPPENS.COM BY ERIC BURKE



https://www.youtube.com/watch?v=pAOyWFOFhsg







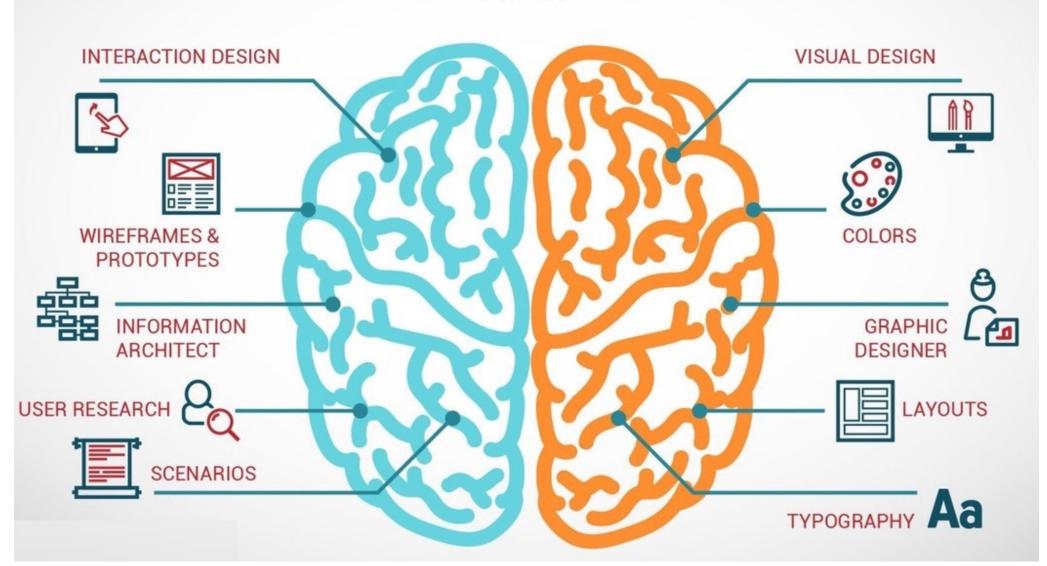
https://www.youtube.com/watch?v=2O3jNQrulHA







**DESIGN** 



#### UX ACTIVITIES IN THE PRODUCT & SERVICE DESIGN CYCLE



Usability bug review Feedback review FAQ review Conference outreach Q&A at talks and demos 10/28 Open Source DevOps

Guest Lecture - Designing Usable Machine Learning-Based Applications (Prof. Jinghui Cheng, Polytechnique Montréal)

https://uxdesign.cc/ui-vs-ux-revisitingdifferences-between-frontend-designaspects-in-2020-and-importance-592ce9ac6360

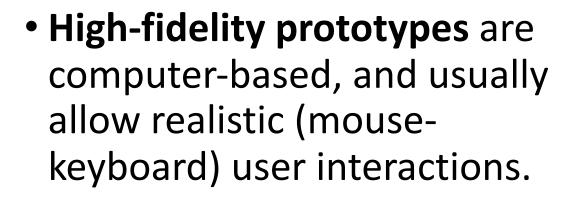
Recruit people for future research

#### Mockups, Prototypes, Stories

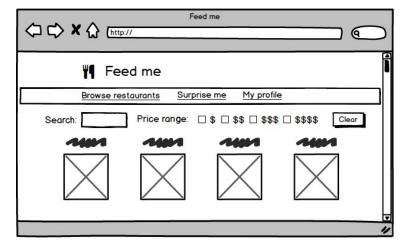
- Humans: better at recognizing whether a solution is correct than solving the problem from a blank page.
- Mock-ups/prototypes help explore uncertainty in the requirements.
  - Validate that we have the right requirements.
  - Elicit requirements at the "borders" of the system.
  - Assert feasibility of solution space.
  - Get feedback on a candidate solution.
- "I'll know it when I see it"

#### High-Fidelity and Low-Fidelity Prototyping

• Low-fidelity prototypes are often paper-based and do not allow user interactions.



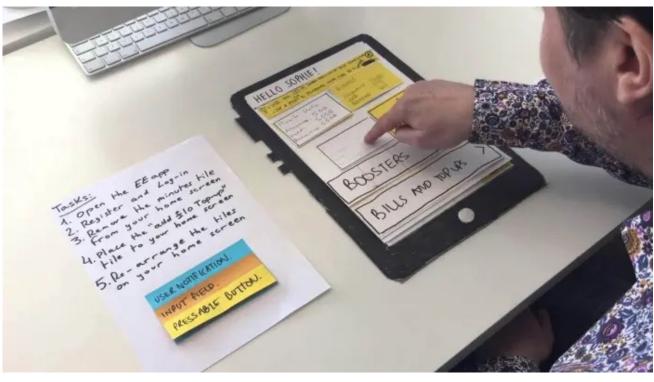






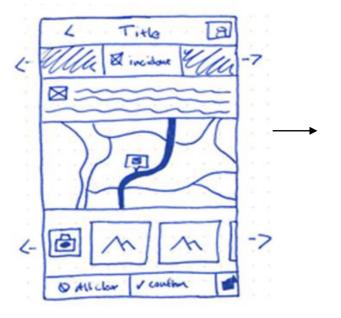
### **Creating Paper Prototypes**





#### Wireframes, low, and high fidelity prototypes





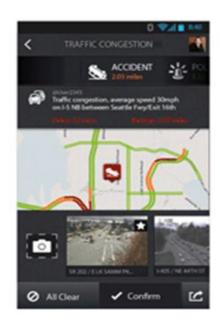
Real state allocation

Low fidelity prototype



Colors and fonts

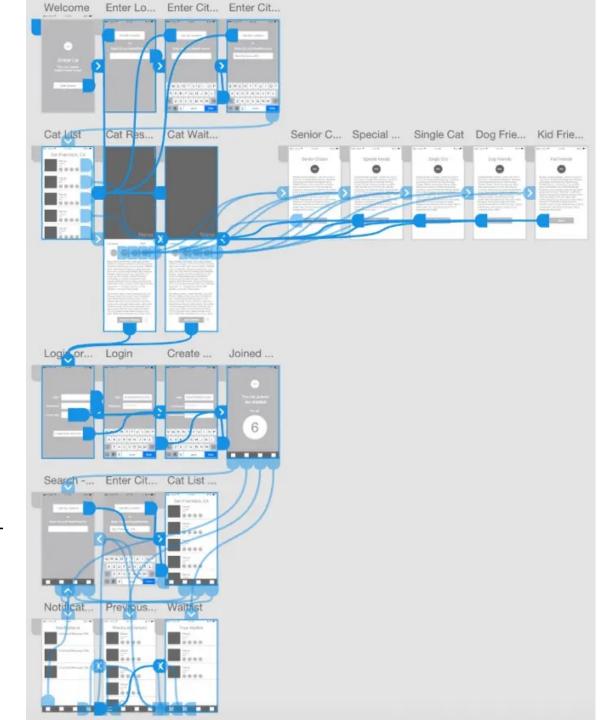
High fidelity prototype



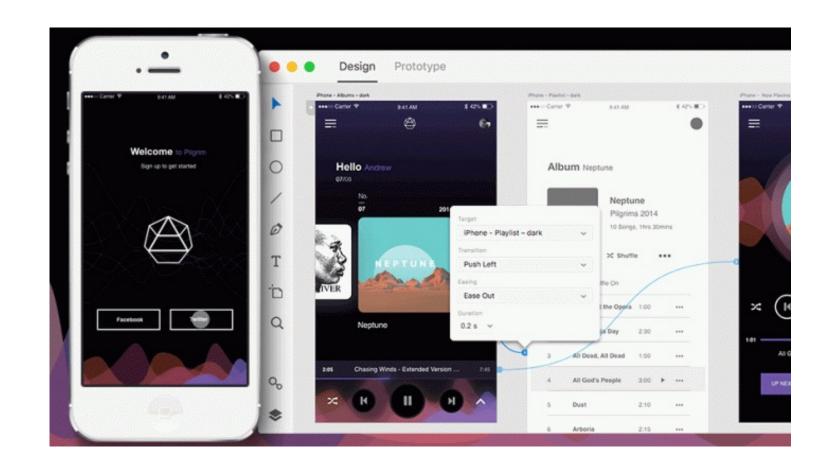
Navigation & mock results

An example of a lowfidelity prototype made in Adobe XD.

https://blog.adobe.com/en/publish/2017/11/29/prototyping-difference-low-fidelity-high-fidelity-prototypes-use.html#gs.d4vv0c



A high-fidelity interactive prototype created in Adobe XD and mirrored on an iPhone.



#### Coded prototypes

- A hi-fi, coded prototype is a solution that is pretty close to the ready-to-release version of a product.
- An example -- a rich interactive sandbox that allows test participants to explore a product's different features.
- Tools: SwiftUI, Framer or CSS

```
DesignCodeWidgetSmall()
struct DesignCodeWidgetSmall: View {
    var body: some View {
        VStack(alignment: .leading, spacing: 4) {
                                                                                                         Matched Geometry Effect
                .font(Font.footnote.smallCaps())
                .foregroundColor(.secondary)
            Text("Matched Geometry Effect")
                .font(.subheadline)
                .fontWeight(.semibold)
            Text("Learn how to quickly transition different views")
                .font(.footnote)
                .foregroundColor(.secondary)
struct DesignCodeWidget: Widget {
    private let kind: String = "DesignCodeWidget"
    public var body: some WidgetConfiguration {
        IntentConfiguration(kind: kind, intent: ConfigurationIntent.self,
            provider: Provider(), placeholder: PlaceholderView()) { entry in
            DesignCodeWidgetEntryView(entry: entry)
        .configurationDisplayName("DesignCode")
        .description("Latest courses and tutorials")
        .supportedFamilies([.systemSmall, .systemMedium])
```

#### Wireframe, Prototype, Mockup

	Fidelity	Cost	Use	General traits
Wireframe	low fidelity	s	Documentation, quick communication	Sketchy, black, white & grey representation of the interface
Prototype	middle to high fidelity	SSS	User testing, reusable backbone of the interface	Interactive
Mockup	middle to <b>high</b> fidelity	SS	Gathering feedback and getting buy-in from stakeholders	Static visualization

https://designmodo.com/wireframing-prototyping-mockuping/

	HIGH-FIDELITY PROTOTYPE	LOW-FIDELITY PROTOTYPE				
Interactivity						
Clickable links and menus	Yes: Many or all are clickable.	No: Targets do not work.				
Automatic response to user's actions	Yes: Links in the prototype are made to work via a prototyping tool (e.g., InVision, PowerPoint).	No: Screens are presented to the user in real time by a person playing "the computer."				
Visuals						
Realistic visual hierarchy, priority of screen elements, and screen size	Yes: Graphics, spacing, and layout look like a live system would look (even if the prototype is presented on paper).	No: Only some or none of the visual attributes of the final live system are captured (e.g., a black-and-white sketch or wireframe, schematic representation of images and graphics, single sheet of paper for several screenfuls of information). Spacing and element prioritization may or may not be preserved.				
Content and Navigation Hierarchy						
Content	Yes: The prototype includes all the content that would appear in the final design (e.g., full articles, product-description text and images).	No: The prototype includes only a summary of the content or a stand-in for product images.				



#### Rapid prototyping

- Throw-away: developed to learn more about a problem, not intended for actual use.
- Evolutionary: intended to be incorporated into the final product.



https://images.app.goo.gl/D54VKKtS4Bpgob3W8

# Personas \*\*personas\* \*\*person

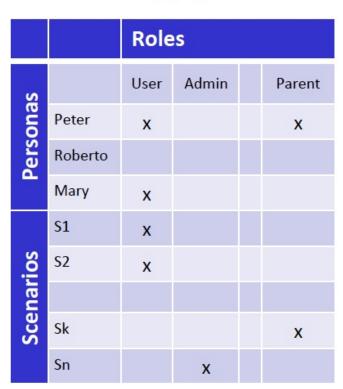
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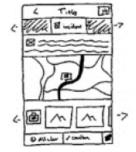
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Scenarios

Persona data	Routine tasks			
Design Implication	Make user's most common tasks clear and apparent in the most visible area of the screen			
Persona data	Infrequent user			
Design implication	Provide wizards or defaults for the most common tasks			
Persona data	Frequent interruptions			
Design implications	Implement mechanisms to pause and recover from where the task was left of?			
Persona data	Bright noisy environment			
Design Implications	Make warnings clearly visible, use high contrast. Do not use audible feedback			
Persona data	Low-computer skills			

Design tactics







Story map

Wireframes

8

Prototypes

User story

Release 3

As a user I want see a list of movies of a given genre

# ROTSURE FALCE



#### **Design and Front-end Engineering Landscape**





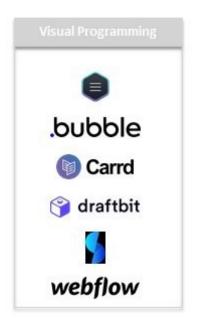














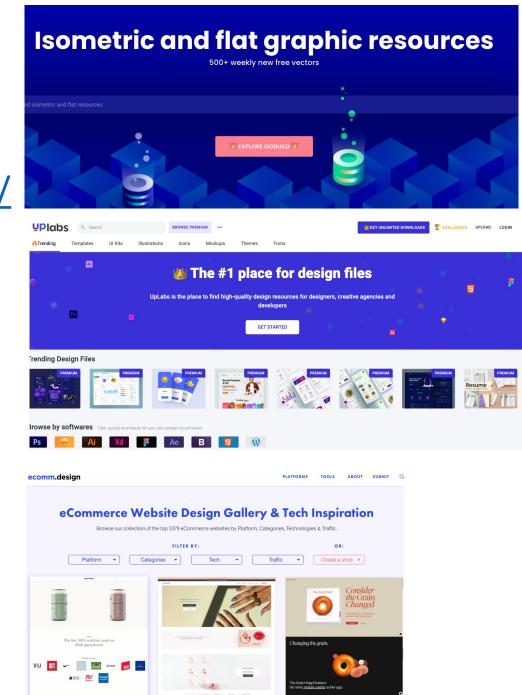






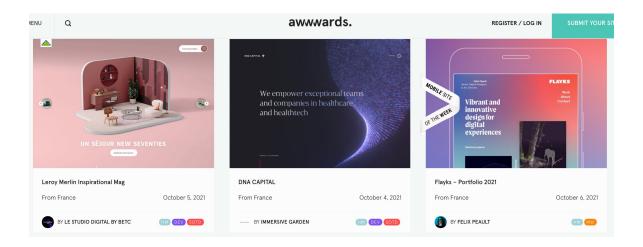
#### Resources (UI design)

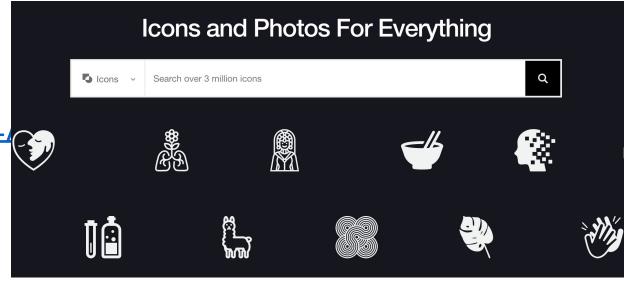
- https://www.myfonts.com/WhatTheFont/
- https://isoflat.com/
- https://www.uplabs.com/
- https://products.ls.graphics/paaatterns/
- https://ecomm.design/



#### Resources

- https://www.awwwards.com/
- https://design-milk.com/
- https://thenounproject.com/
- https://www.bestfolios.com/home
- https://uxdesign.cc/
- https://thefwa.com/awards/page/1





# WHEN CLIENT EMAILS ASKING FOR MORE REVISIONS...

