Midterm Review

CS571: Building User Interfaces

Cole Nelson

Midterm Details

- Tuesday, 10/25 @ 5:45p-8:15p (2.5 hours)
- 32 questions worth 15 points covering Weeks 1-6.
  - 20 Multiple Choice (0.25 pts each)
  - 10 Short Answer (0.5 pts each)
  - 2 Long Response (2.5 pts each)
  - Half programming, half design
- Closed book, closed internet, closed interpreter.
- You may bring one double-sided standard size notesheet. Handwritten or digital is OK.

Overview

This class is split into 2 sections...

1. How do we make user interfaces *usable*? How do we study our users? How do design, and how do we evaluate these designs?
2. How do we *build* such user interfaces using practical tools like JavaScript and React (Web), React Native (Mobile), and DialogFlow (Voice)?

A Review of Design

Week	Topic
Week 01	Design Thinking
Week 02	Prototyping
Week 03	Visual Design
Week 04	Web (& Desktop) Design
Week 05	Interaction Design
Week 06	Expert Evaluation

Week 01: Design Thinking

- What is design thinking?
- What are the steps involved in Design Thinking?
  - Can you define each?
  - Can you give examples of each?
    - Can you further explain these examples?

Week 02: Prototyping

- What is prototyping?
- What are the methods, theory, models, and strategies that we use?
  - Can you define each?
  - Can you explain them?
- What is fidelity?
  - Can you identify lo vs hi fidelity prototypes?
  - Can you explain the pros and cons of each?
- How do we use prototypes?

Week 03: Visual Design

- What are the elements of visual design?
- What are the principles of visual design?
  - What is the difference between these two?
- Given an image, can you identify elements and principles of its visual design and how it contributes?
- Can you use elements and principles of design to create your own design?
- How can we effectively use type and color?

Week 04: Web (& Desktop) Design

- What is the WIMP paradigm?
  - Can you define and give examples for each?
- What tools do we use to guide the navigation of pages?
  - Can you define and give examples for each?
- What is the fold and how does it impact design?
- How does the way we design for the web differ from the way we design for desktop?

Week 05: Interaction Design

- What is interaction design?
- What are the 5 dimensions of interaction design?
  - Can you define and give examples of each?
- What are the 4 categories of info archeticture?
  - Can you define and give examples of each?
- How does layout impact design?
  - What sorts of tricks and tactics can be used?
- What are the different models for a user to navigate a set of webpages?

Week 06: Expert Evaluation

- What are expert evaluation methods?
  - How do they differ from user evaluation methods?
- What is a heuristic evaluation?
  - What the 10 heuristics as defined by Nielsen?
  - How can you apply these heuristics to a webpage?
- What is a cognitive walkthrough?
  - What are the 4 questions that are asked?
  - How can you apply these questions to a webpage?

A Review of Implementation

Week	Topic
Week 01	JavaScript Essentials
Week 02	JavaScript Requests & Bootstrap
Week 03	React Essentials
Week 04	React Hooks & Optimization
Week 05	User Input & APIs in React
Week 06	Persistance & Big Picture of React

Week 01: JS Essentials

- What are HTML, CSS, and JS, and what do they provide for the webpage?
- What is the syntax for HTML and JS?
  - Given some requirements, can you write small code snippets for these languages?
- What is the DOM?
  - How is it structured?
  - How do we use JS to manipulate it?

Week 02: JS Requests & Bootstrap

- What is a JS Object?
  - How does it differ from JSON?
  - How do we convert between the two?
- What is an API?
  - How do we make GET requests to an API?
  - How does its async behavior affect our code?
- What is a callback function?
- What is Bootstrap?
  - What does it provide and how do we use it?

Week 03: React Essentials

- Why React?
  - What is the "virtual DOM" and how does it work?
- How are React apps constructed?
- What "language" do we typically use to write React components?
  - Can you write small code snippets for this?
- How are `props` passed from parent to child?
- How do `useState` and `useEffect` work?

Week 04: React Hooks & Optimization

- What is the difference between reference, shallow, and deep copying?
  - Why must we not *directly* mutate the state?
- How can we accomplish routing in React?
- How do we `useContext` to provide context to large and/or complex hierarchies?
- How do we `useCallback` and `useMemo` to optimize our components?
- What should we consider to `memo`-ize a component?

Week 05: User Input & APIs in React

- What are the 2 ways to gather user input via fields?
  - What are the differences between these?
  - When might we use one versus another?
- How does HTTP work?
  - What are the common classes of codes?
- What are the CRUD operations in HTTP?
- How can we use `fetch` to perform CRUD?
  - Can you write small code snippets for this?

Week 06: Persistance & Big Picture

- What are the ways we can persist data?
- What is a custom hook, and what is it useful for?
- How is a React app made production-ready?
- How is a React app delivered to a client?
- What considerations should we make when deploying our React application?
  - Can you give examples and use cases to support these considerations?

Quick Reminder

Please complete the AEFIS Mid-Semester Survey by Saturday, October 22nd! 🙂

This is optional and not required but encouraged!

Please submit the Canvas assignment acknowledging that you *can* (but don't have to) complete it.

Good Luck!

You'll do great! 🙂