Monday, March 31, 2025

COMP-SCI LOGIC & CODING - **FINAL PROJECT PREPOSAL**

This document outlines the concept, technical approach, and visual inspiration for my final project in Comp-Sci Logic & Coding: an interactive, scroll-based timeline portfolio website built using HTML, CSS, and JavaScript.

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TABLE OF CONTENTS

FINAL PROJECT PROPOSAL: INTERACTIVE TIMELINE PORTFOLIO

PROJECT DESCRIPTION

For my final project, I will develop an interactive portfolio website featuring a dynamic, scroll-based vertical timeline. Upon loading the website, users will initially see a subtle vertical line, serving as the foundation of the timeline. As they begin scrolling down, this vertical line will expand smoothly from the top to the bottom of the screen, visually guiding the user through the chronological progression of projects / designs.

Dots will appear on these timelines with some preview content of a project, which the veiwer can click to reveal more infromation about a project. The idea is to create a unique portfolio viewing experience through time based organization.

Included information
- Main images
- Description
- Process exploration
- External Links
    - Web links for when a project has a standalone site
    - PDF downloads for when a project

CHALLENGES / COMPLEX FEATURES

Homemade CMS
- My current portfolio is designed using webflow & CMS. That sort of scalability and functionality is something id like to integrate into this portfolio as-well.

- Each project in the portfolio will be stored as a separate JSON file to keep the content modular and easy to manage. Instead of hardcoding data into the site, a simple backend function will dynamically read all the project files and serve them to the frontend.

- This will be set up using Vercel's serverless functions, along with next.js[1]

- While I haven't built this type of file-based content system before, I have a solid grasp of the concept, and with support from AI tools, I'm confident in my ability to implement it effectively.

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[1] "Next.js by Vercel - the React Framework," nextjs.org, n.d., https://nextjs.org.

Modular Component Design

· I hope to implement a method where each timeline entry will be generated by a reusable JavaScript component function. This function will receive content from individual JSON files and construct the appropriate HTML layout dynamically, allowing new projects to be added simply by uploading new data.

· *My Concern* for this will be how to handle proejcts that have different data, like a missing process & development paragraph, or only one image with no detailed shots.

Custom Scroll for even content distribution

· The main bulk of content in my portfolio are from school projects / adapted from school projects. As such, there is a significant spike in content creation from September - May, and less or no content over the summer.

· To maintain a consistent and engaging scroll experience across periods of varying project density, I plan to implement a custom scroll system that adjusts scroll speed based on content availability. During sections with little to no content, the site will scroll more rapidly, effectively "fast-forwarding" through empty sections.

· Id like to implement a P5.js animation that accompanies the speed changes. My plan is to implement a particle system similar to apples motion sickness accessibility feature. These particles will have some individual motion to themselves, but will be anchored to the canvas and scroll up with the page. The speed jumping effect can be mimicked by making these particles move upwards faster, faking a motion effect. [2]

· *I am currently unsure* the best approach to implement this, but am confident I can find a good approach once the site is built

  · Implement a scroll trigger that moves content upwards in low content areas, shortening the amount of time spent in emptiness

  · Have the space (representing time) of the entire page be dictated as spacing from the project elements. No projects = no space, faster jump to next section.

  · Use filler or personal content for low content areas; show smaller commission projects I worked on, personal content like dog pictures, music I liked.

Embedding 3D Models for select products

· I am also exploring the possibility of integrating 3D models into the timeline to highlight select projects. This would involve using a JavaScript library such as Three.js or ModelViewer to embed interactive 3D content directly into the page.

· Its a feature I've been planning / hoping to add to my actual portfolio site for some time, but currently just use sketchfab integration; which is somewhat limited in customization, and many features are behind a paywall. It'd be interesting to use this project as a testing ground for how I could implement a more professional solution.

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[2] "Apple Accessibility Features, Motion Sickness," Apple Newsroom (Canada), n.d., https://www.apple.com/ca/newsroom/2024/05/apple-announces-new-accessibility-features-including-eye-tracking/.

OTHER FEATURES

- Status / progress navbar
    - Some sort of interface component that informs the user on their progress through the timeline
- Zoomable timeline
    - Increase / decrease size or detail level of timeline?
        - Manual user input?
        - Automatically condense over areas of lesser interest (ie. during school there will be an entry every 2-3 weeks, wheras during summer / breaks there will be much less on the timeline.
- Different modes?
    - Gallery mode - just shows images on timeline
    - Card Mode - shows one image + title, desc etc.
- Light & Dark mode toggle?
- Depending on time I have for development, could design project pages, or potentially use a redirect to my existing portfolio site.
    - Might be some way to implement a back to timeline button on my actual site depending on the link I access through?

LINKS

Educational Refrences
- W3 schools - interactive timeline tutorial
    - https://www.w3schools.com/howto/howto_css_timeline.asp
- Interaction Observer - Could help with custom scroll interactions
    - https://developer.mozilla.org/en-US/docs/Web/API/Intersection_Observer_API
- Css Tricks - Reading position progress bar with JavaScript
    - https://css-tricks.com/reading-position-indicator/
- GeeksforGeeks - Dynamically creating new elements with JavaScript
    - https://www.geeksforgeeks.org/how-to-dynamically-create-new-elements-in-javascript/
- Vercel - How to ues next.js to load data from static files
    - https://vercel.com/guides/loading-static-file-nextjs-api-route
- Make use of - Creating an interactive timeline with CSS.
    - https://www.makeuseof.com/interactive-timeline-html-css-javascript/

Inspirational Refrences

- GSAP - animation library recently aquired by webflow
  - Site itself has nice design, also features a library of unique scroll effects & triggers.
    - https://gsap.com/
- Relume - Animated timeline component
  - Interesting implementation of an interactive scroll timeline
    - https://relume-timeline-cloneable.webflow.io/
- Flowbase - Timeline Templates
  - Beautifuly simple UI design. Lacking some interactive elements
    - https://flowbase.co/preview/vario-timeline-02