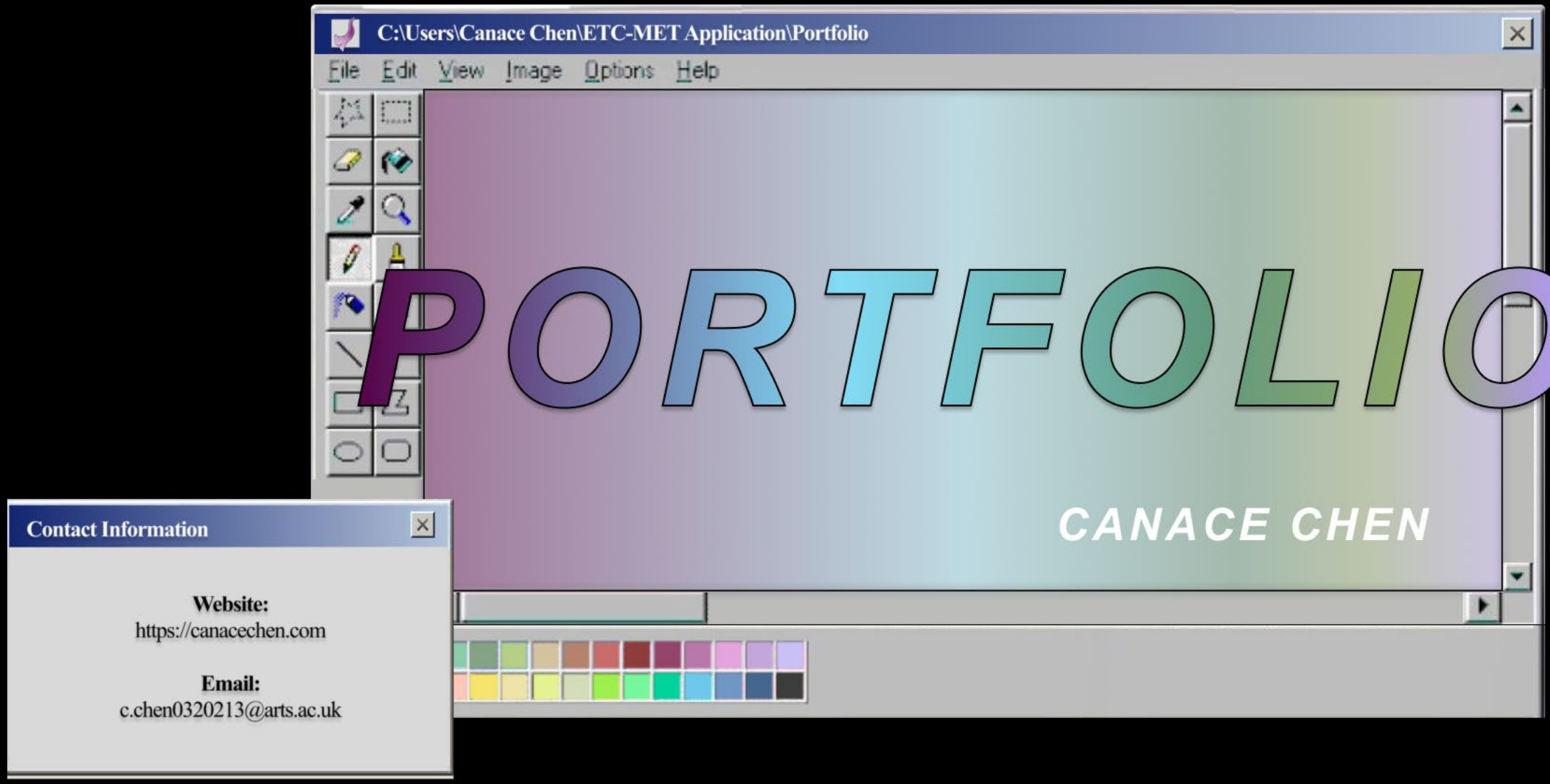
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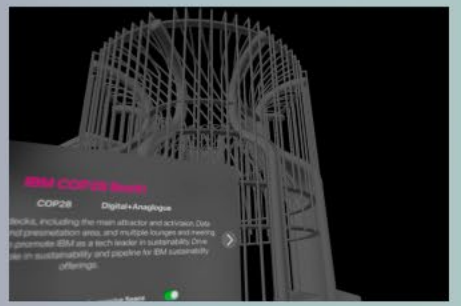
PORTFOLIO
CANACE CHEN
Contact Information
Website:
https://canacechen.com
Email:
c.chen0320213@arts.ac.uk

01

Storytelling with Multi-Sensory AR

02



Interactive & Immersive Virtual Activations Gallery

03

Game from the Perspective of the Colourblind

04

Generative AI Historical Scene Explorer

05

Additional Works: Featured Professional Projects

Storytelling with Multi-Sensory AR

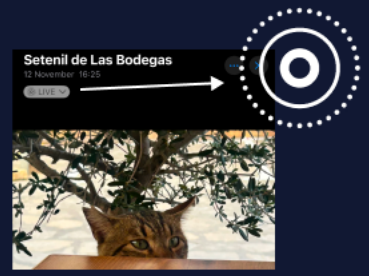
This project combines augmented reality and interactive storytelling to create an immersive, multisensory experience. The project emphasises user participation, accessibility, and collaboration, highlighting the potential of AR in art while exploring human-computer interaction and inclusive design.

Tools:

Keywords:
#Human-Computer Interaction #Augmented Reality #Interactive Storytelling #Accessibility #Multimedia Art #ParticipatoryDesign

Website:
https://canacechen.com/beforethesunrises.html

Research

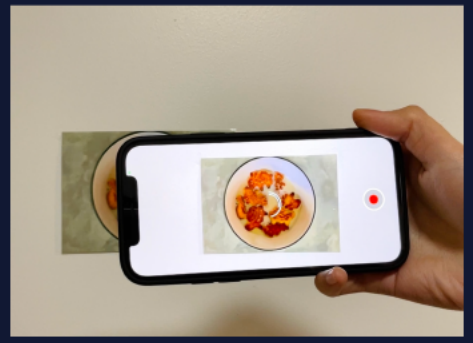


Inspiration

The inspiration for the artwork was apple's live photo. When the user presses and holds a live photo, a short animation from the time when the photo was taken will be played.

Multi-sensory AR as an accessible medium

AR empowers the connection between the human senses and technology; it blends digital information with the real world for people to have a unique perspective. This gives AR the potential to influence people emotionally and socially (Pucihar and Kljun, 2018). Choosing AR allows users to experience the artwork with multiple senses, enabling a more engaging and immersive experience while enhancing inclusiveness for diverse users.



AR for mobile phone user

Since AR is displayed using a mobile device, the screen will be relatively small and the user will have one of the hands occupied. In this case, it would be easier for the user to move the device relative to the real world rather than moving their fingers on the screen (Henrysson, Billinghurst and Ollila, 2005).

Collaborative AR

The interface needs to display its components with clear visibility and information so that the users will understand the purpose of each component and find the right one to use. The tools should not take too many interactions to use because having faster switches among the them will allow the users to multitask better (Jacucci, 2005).

User Groups

User Group	Needs and Wants
General public	• Engaging narrative and visually appealing experience • Clear and easy-to-follow instructions to ensure understanding • Seamless interaction between physical and digital elements
Art/Technology Enthusiast	• Smooth, intuitive, and logical operation • Enjoyable exploration of interactive art and technology • Ability to understand both the technical and artistic aspects of the experience
Families	• Age-appropriate content that is entertaining and accessible to all family members • Simple and intuitive user interface for ease of interaction • Non-technical instructions for smooth usage by all age groups
Students	• Inspiring and thought-provoking content • A well-organized, clear, and engaging user journey
People with disabilities	• inclusive design • Comprehensive accessibility research to meet diverse needs
Elderly Users	• Larger text and buttons for better readability and ease of navigation • Simple interactions with minimal steps to avoid confusion

Animation Making

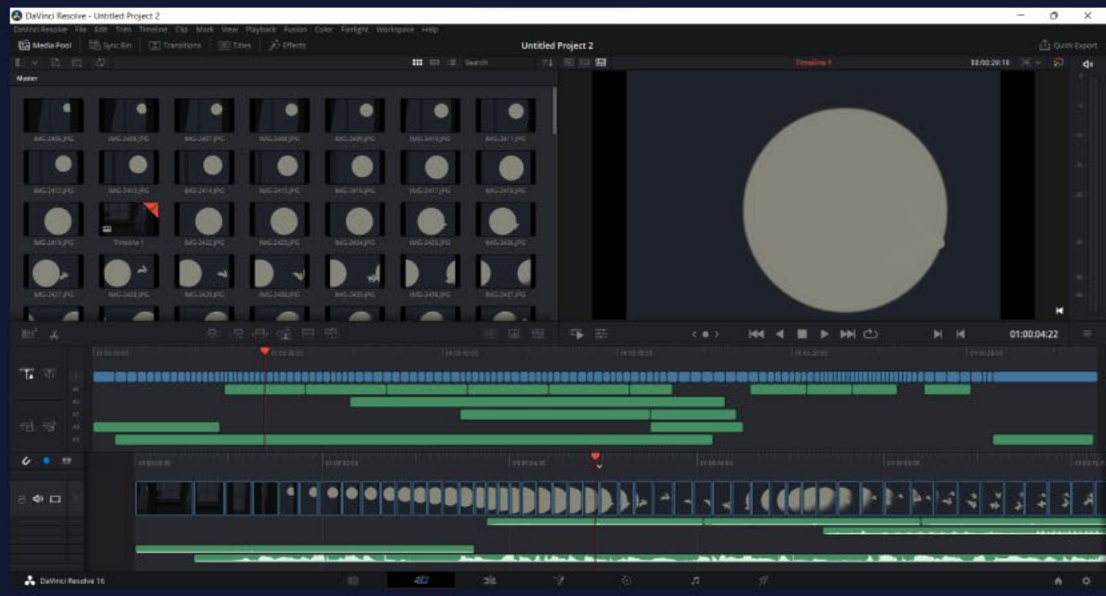
Monkeys
(from Daoshi)

Yutu
(from Hanyuefu)

Jingwei
(from The Classic of Mountains and Seas)

Xuanwu
(from Chu Ci)

Story
The animals from mythologies run across the sky every night, and before people wake up, they fall from the sky and become animal shaped biscuits.

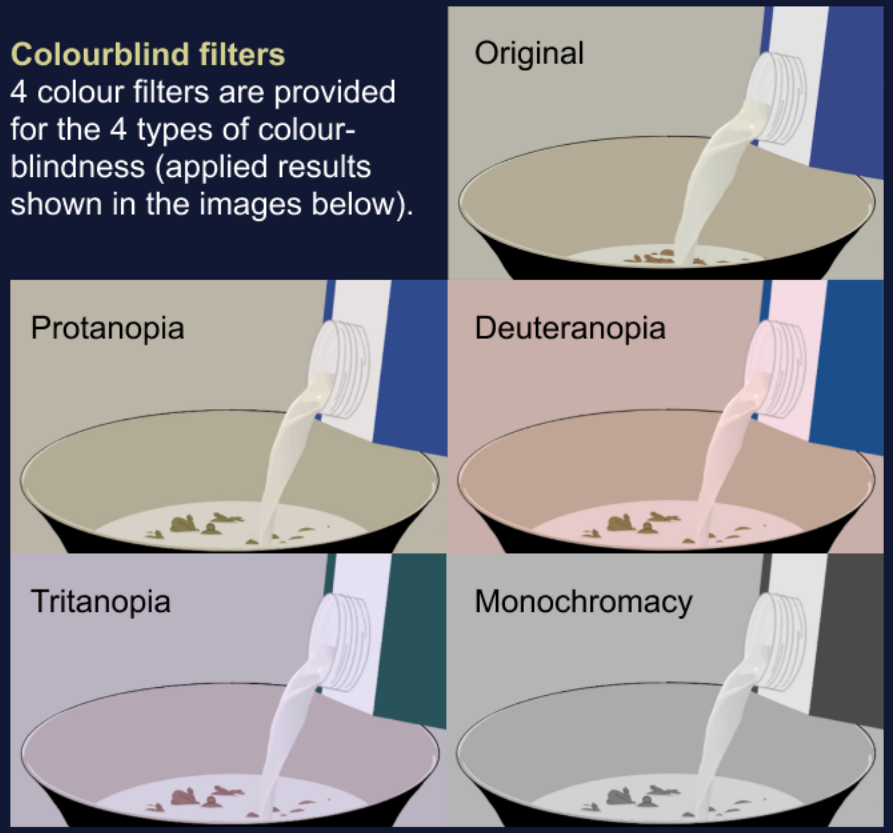


(left) Storyboard (pencil on paper)
(right) Frame-by-frame animation illustration (Procreate)

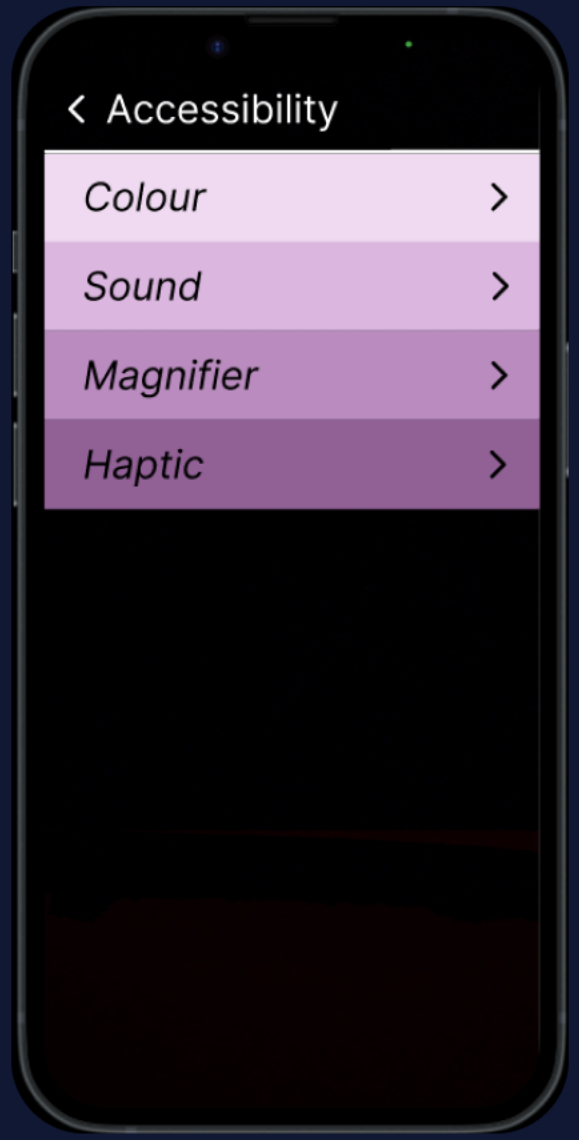
The animation was made using Da Vinci Resolve 16. Since animating on 2s is commonly used in animation studios (Lally et al, 2018), this technique is adapted here to reduce the workload.

Colourblind filters

4 colour filters are provided for the 4 types of colour-blindness (applied results shown in the images below).

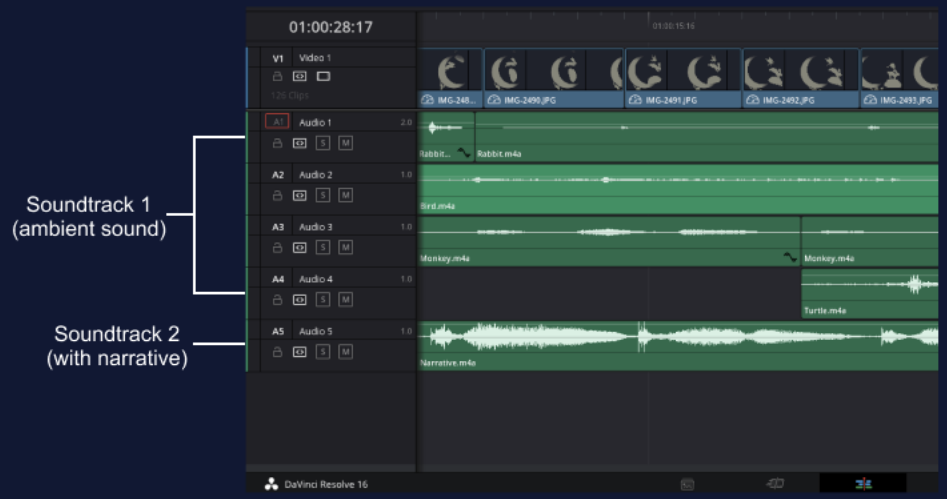


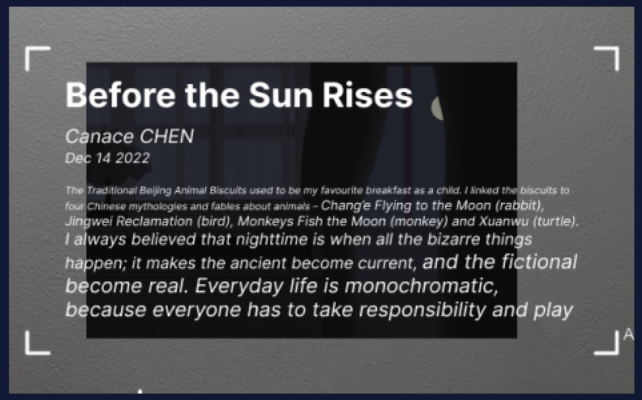
Accessibility



Dual Soundtracks

The animation provides 2 sound tracks: one with the story narrative and one with only ambient sound. The story narrative is designed to help people who needs more context in order to understand the story, especially for blind people who heavily relies on hearing when experiencing the world (Bisenzi and Carducci, 2022).





Magnifier

Enlarges any part of the interface and objects in front of the camera, making it easier for older users to see and read.

Haptic Feedback

The haptic system is enabled by default. It vibrates twice when the app is ready to scan, when the photo has been successfully recognised, when the photo is not within the frame during the animation, and when the animation is finished. It vibrates once when the user presses a button. It provides feedback to help guiding users and improve overall perception (Díaz et al, 2006).
The User can turn it off manually.

AR Interface Development

Scanning Page

Helps users align the photo print with the app's on-screen frame for accurate recognition. The app checks the surrounding lighting to ensure a successful AR experience. If the environment is too dark, users are prompted to turn on the flashlight.

Multi-sensory AR Animation

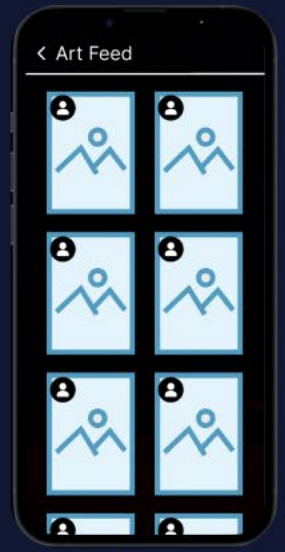
Once the photo is recognised, the Multi-sensory AR animation begins to play over the image. A red button is included for users to capture photos or record videos, creating a sharable experience.

Info

The Info page overlays essential project details on photo/animation. It displays the project name, artist(s), completion date, and the artist statement, providing additional context and background.

AR Collaboration Tool

Invites users to move their phones to engage directly with the artwork. Adding their own "graffiti" on top with the selection of brushes and colours provided. This participatory design encourages creativity, collaboration, and engagement, allowing users to become co-creators and inspire each other, all while maintaining the integrity of the original piece.



Art Feed

A curated space for inspiration. It allows users to explore other projects and artists, fostering a sense of community and promoting the exchange of creative ideas, encouraging further exploration and collaboration in the AR space.

Result Showcase

Interactive & Immersive Virtual Activations Gallery

This project investigates how immersive technologies can enhance experiential marketing through interactive AR and VR. Drawing upon user-centred design principles and industry research, it explores spatial computing's role in delivering authentically engaging brand experiences.

Tools:

*3D models designed and developed by GPJ UK Creative Team

Keywords:
#Augmented Reality #Virtual Reality #Human-Computer Interaction #Spatial Computing #Experiential Marketing

Website:
https://canacechen.com/gpjactivationsgallery.html

Research

91%

EventTrack found that 91% of consumers report having more positive feelings about a brand after participating in immersive and interactive experiences.

Grand View Research's study indicates that the global AR in retail market size was valued at USD 3.76 billion in 2022, with expectations for robust growth at a compound annual growth rate (CAGR) of over 47% from 2023 to 2030.

3.76 billion

A Bizzabo survey found that 84% of event planners are investing in emerging technologies like AR/VR to create personalised, memorable experiences.

By developing a past activation collection on Apple Vision Pro, we harness a spatial computing device to deliver deeply immersive and interactive experiences. Instead of relying on traditional 2D media to showcase past events, this approach leverages mixed reality environments where users can intuitively explore, engage, and interact with the content (Apple, 2023).

This approach not only differentiates our offering in a competitive market but also aligns with evolving industry trends where brands continually demand memorable, authentic experience through utilising cutting-edge technologies (BCG 2021). Ultimately, this app amplifies the storytelling potential of experiential marketing, delivering a more meaningful connection between clients and the creative capabilities behind each activation.

Purpose

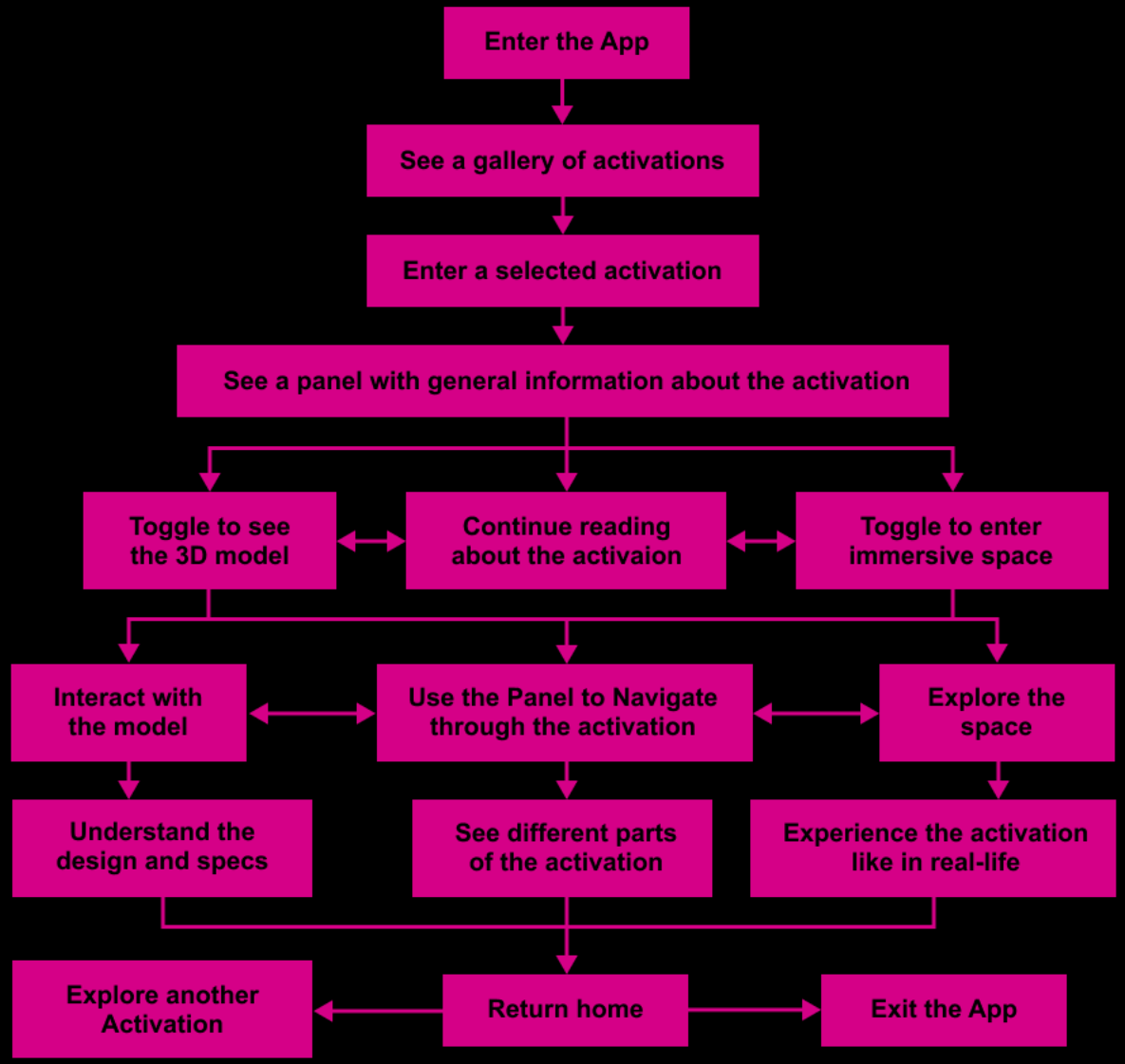
This app immersively showcases the company's past activations, letting users explore and interact with projects through a gallery, detailed miniature models, or full-scale virtual experiences. Designed for both self-guided and client presentations, it highlights our experiential marketing expertise and capabilities.

Functionalities

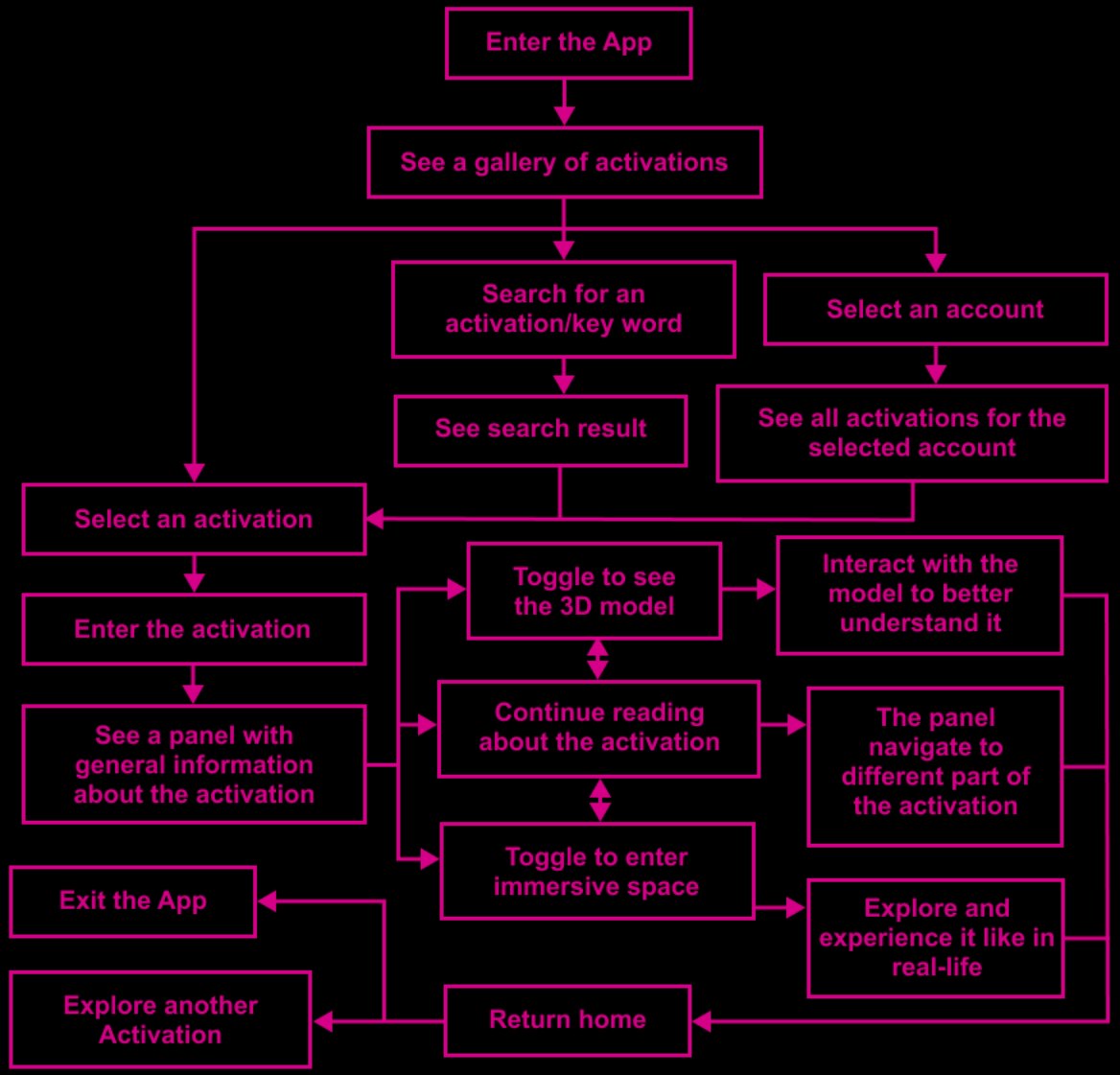
- Gallery of Activations: A visual catalogue of all past activations.
- Guided Tour: Providing insights on each activation interactively.
- Interactive Miniatures: Explore miniature models for better understanding.
- Immersive Activation Experience: Virtually enter life-size activations for an authentic experience.
- Activation Explanations: Detailed information about each activation.

User Journey

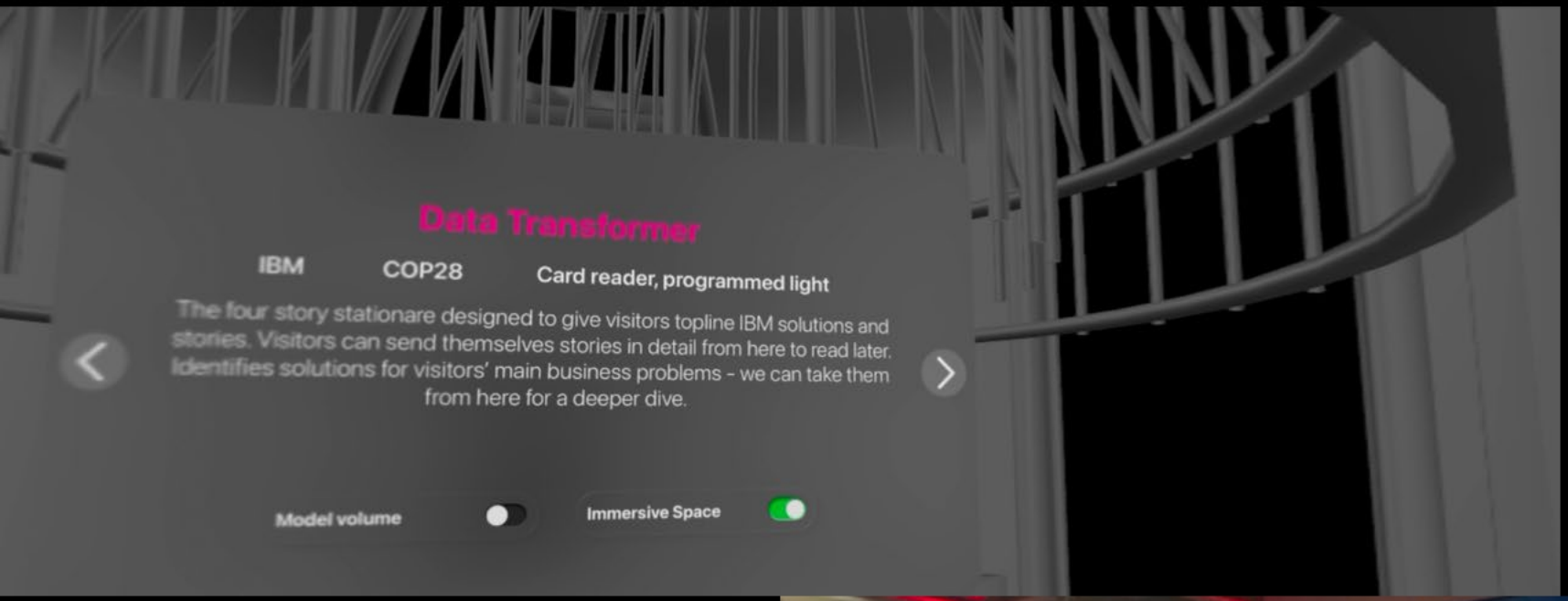
Client Experience



Self-guided Experience



Interaction Design



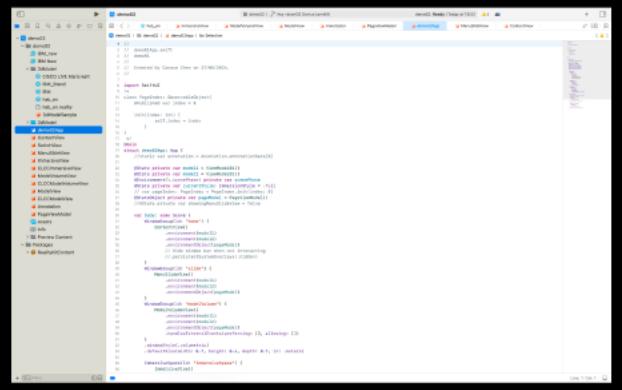
By toggling the “Immersive Space” option on the interface panel, the user steps directly into the activation, allowing them to move around as if physically present. This approach offers an authentic sense of space and scale, immersing them in the atmosphere and depth of each activation.

VR

By toggling the “Model Volume” option, a miniature model of the activation appears beside the panel. They can rotate, zoom, and inspect each component closely, gaining insights into design details, spatial arrangements, and material selections. By closely examining the activation from understanding of the work.

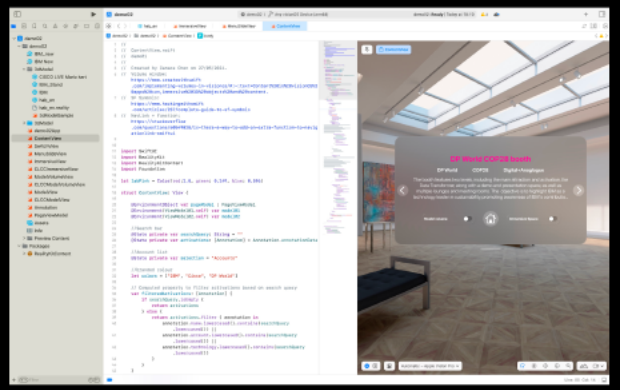
AR

Implementation



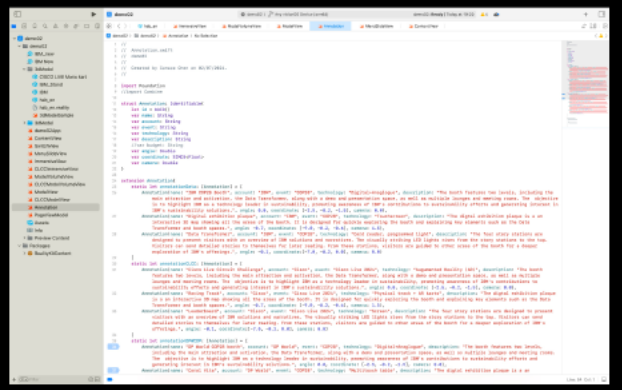
App Setup

Initialises shared variables and view models, configuring window groups, styles, and immersive settings.



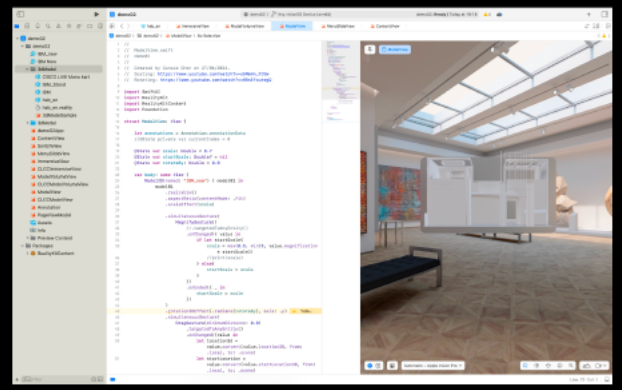
Homepage

Displays the initial homepage, showcasing all past activations and allowing users to choose which to explore.



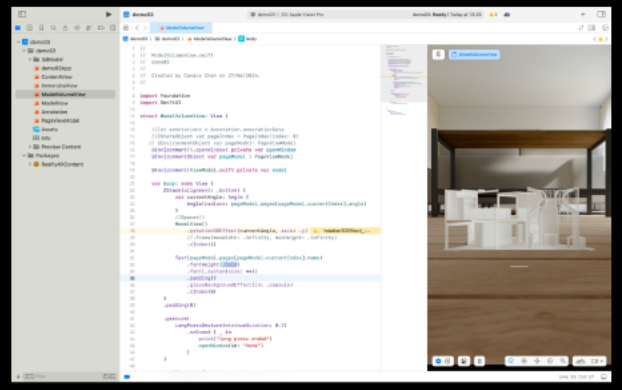
Centralised Data Storage

Stores and organises all data—accounts, names, and design specifics—supplying structured information to other views.



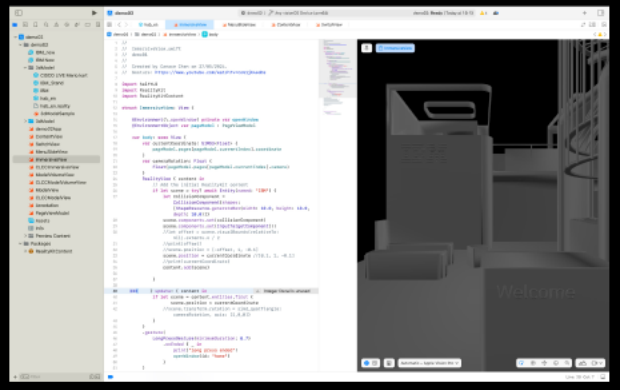
Interactive 3D Model Controls

Renders the 3D activation model and enables user interactions like rotation and zoom.



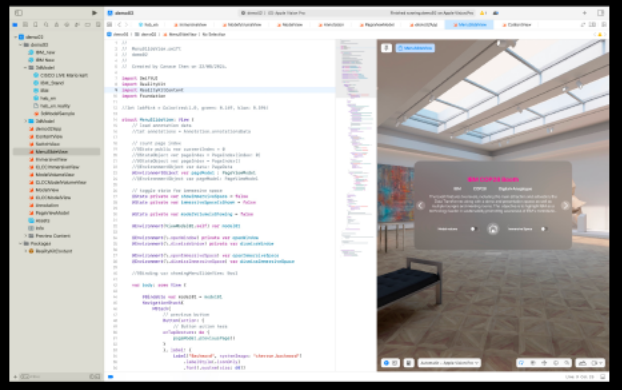
Miniature Model Display

Shows the interactive 3D miniature model with its name, connecting to underlying 3D controls for detailed inspection.



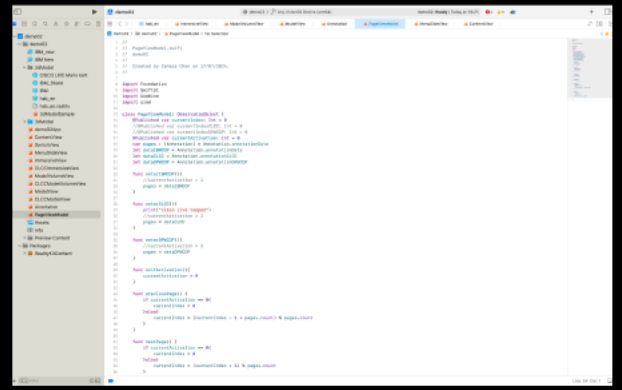
Life-Size Virtual Environment

Creates the fully immersive, room-scale VR experience, enabling users to navigate a true-to-scale activation space.



Content for the Panel

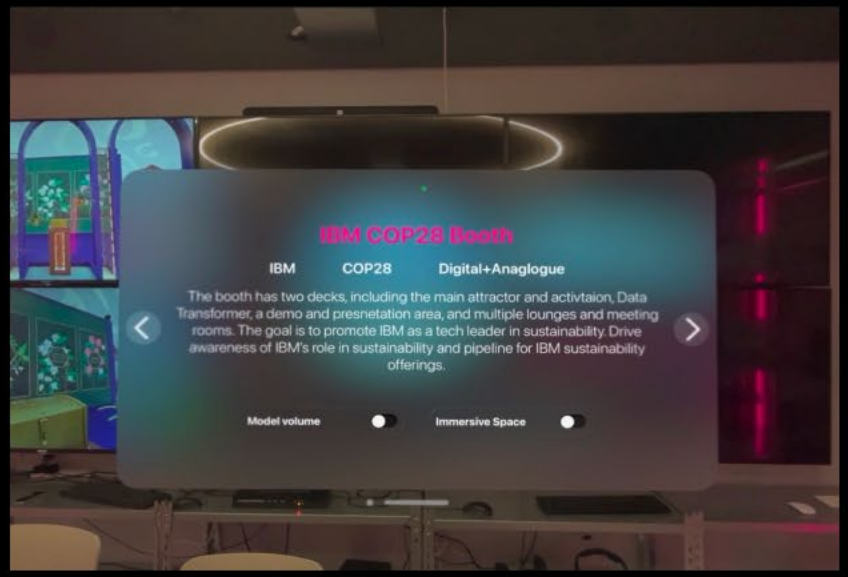
Presents activation details, provides toggles to switch for AR model and immersive space, and a button to home.

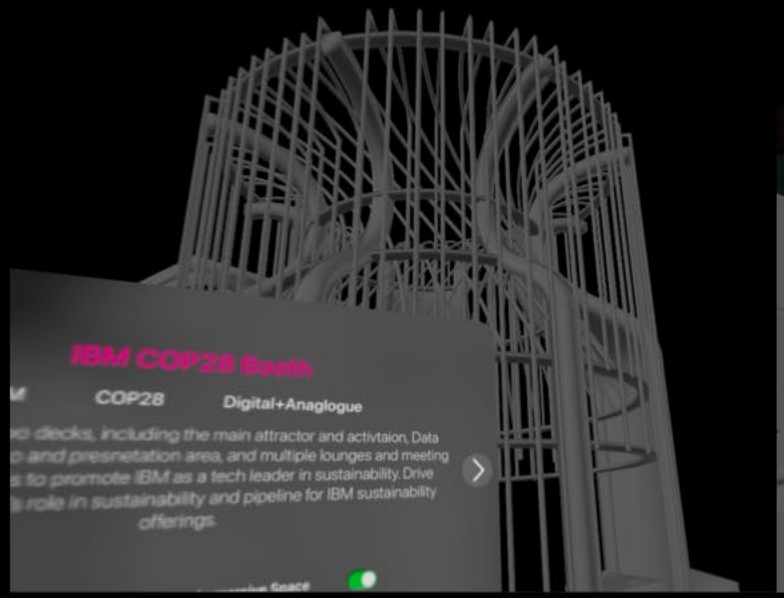


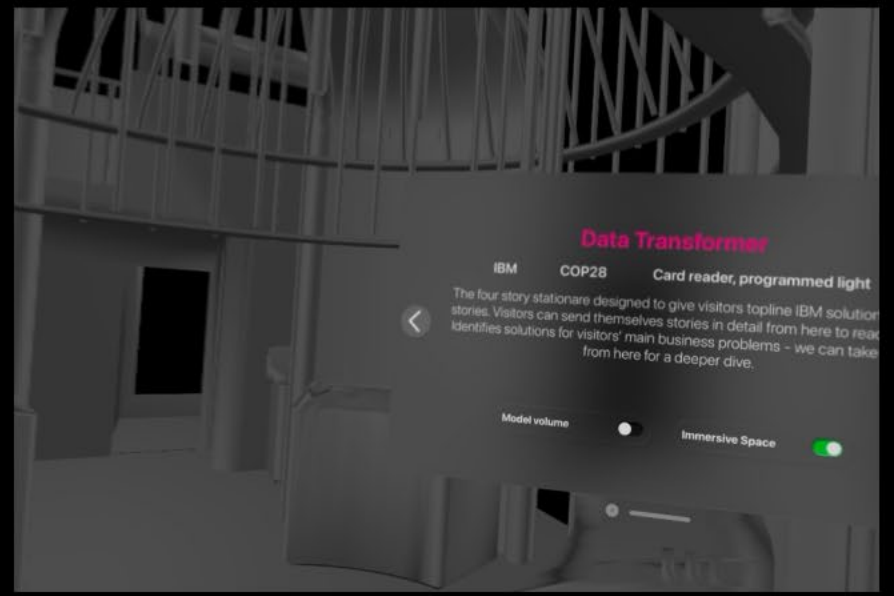
Dynamic Navigation and Layout

Manages navigation logic, displaying chosen content while maintaining a consistency in page structure and flow.

Result Showcase







Game from the Perspective of the Colourblind

A retro triptych of games that aim to raise awareness about colour blindness, each level is designed to represent one of the three types of colour blindness: deuteranopia, protanopia, and tritanopia.

Tools:

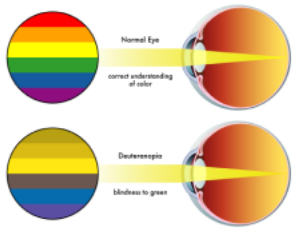
Co-created with
Diana Milena Galindo Clavijo

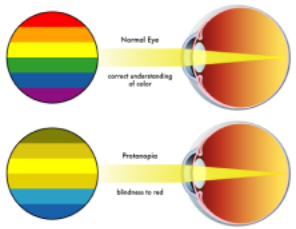
Keywords:
#Game Design #UI/UX Design #Gamified Learning
#Digital Inclusion #Interactive Storytelling

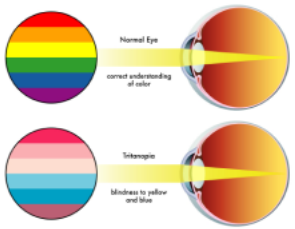
Website:
https://canacechen.com/conescious.html

Research

Deuteranopia	Protanopia	Tritanopia	
		Tritanopia	Tritanomaly
Refers to Red/Green colour blindness.	Refers to insensitivity to red light, leading to confusion of greens, reds, and yellows.	Refers to Blue/Yellow colour blindness.	
Congenital condition, present from birth. Defective or missing medium-wavelength cones (M-cones).	Hereditary condition caused by defective or missing long-wavelength cones (L-cones).	Missing short-wavelength cones (S-cones).	Defective short-wavelength cones (S-cones).
Affects 1 in 12 men and 1 in 200 women according to the UK National Health Service.	Most common form of colour blindness.	Rare.	
Difficulty seeing different shades of red, green and yellow.	Difficulty distinguishing reds and greens.	Struggles with distinguishing between colours containing blue or yellow, such as green and blue or and purple and red.	Difficulty differentiating green/blue and red/yellow hues.







740 - 625 625 - 590 590 - 565 565 - 520 520 - 500 500 - 435 435 - 380

Peak Sensitivity:
564 - 580 nm

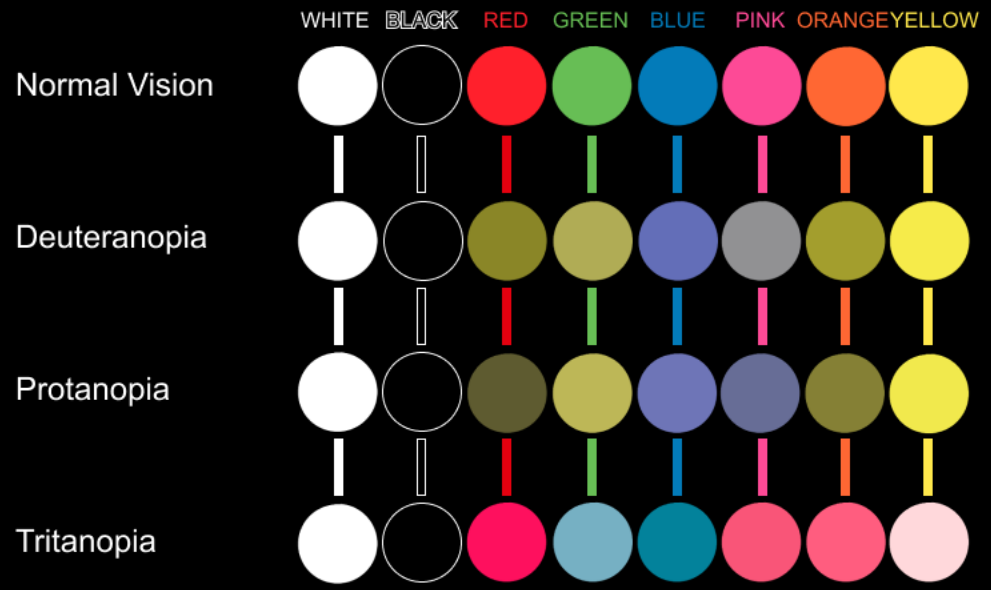
OPN1LW
L-cone

Peak Sensitivity:
534 - 545 nm

OPN1MW
M-cone

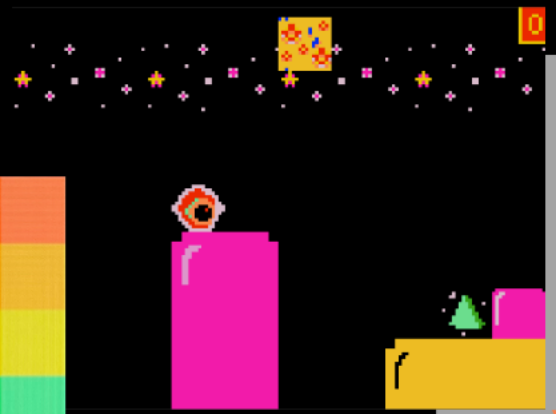
Peak Sensitivity:
420 - 440 nm

OPN1SW
S-cone

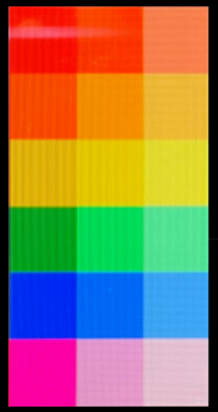


Game Concept & Design

The game raises awareness about colour blindness by immersing players in its three main types: Deuteranopia, Protanopia, and Tritanopia. Starting in black and white, players navigate colour-shifted levels, collect missing cone cells, and restore full colour vision. Completing all levels reveals the true colour spectrum.

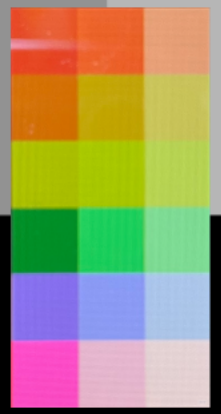


Home page designed and developed by Diana Milena Galindo Clavijo.



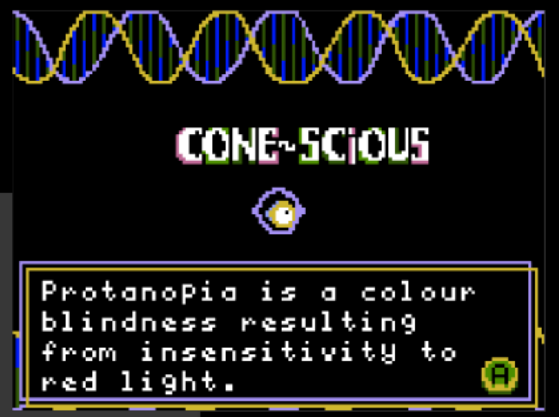
Game 1: Deuteranopia
Navigate platforms and collect the missing green genes while avoiding falling to progress.

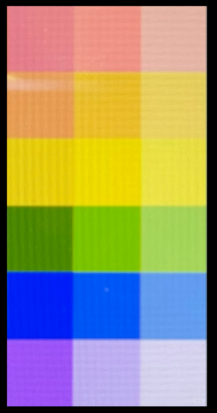
(Designed and developed by Diana Milena Galindo Clavijo)



Game 3: Tritanopia
Traverse a maze, collecting the missing blue genes while steering clear of incorrect genes to find the exit.

Game 2: Protanopia
Gather the missing red genes while avoiding other distracting or incorrect genes.



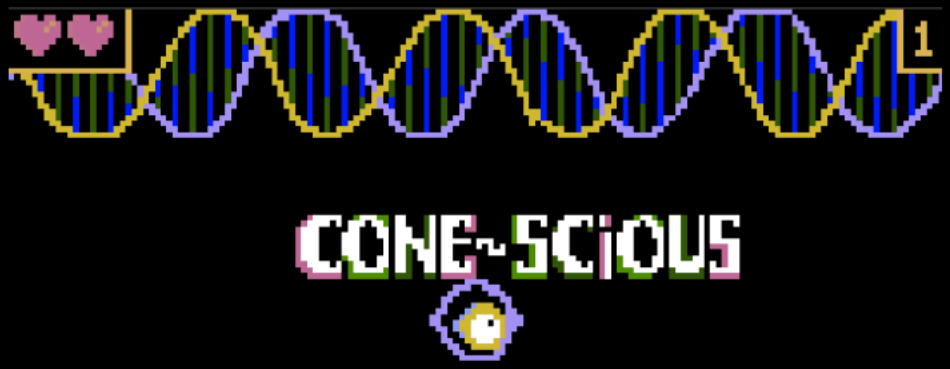


Creating Colour Palette for Each Game

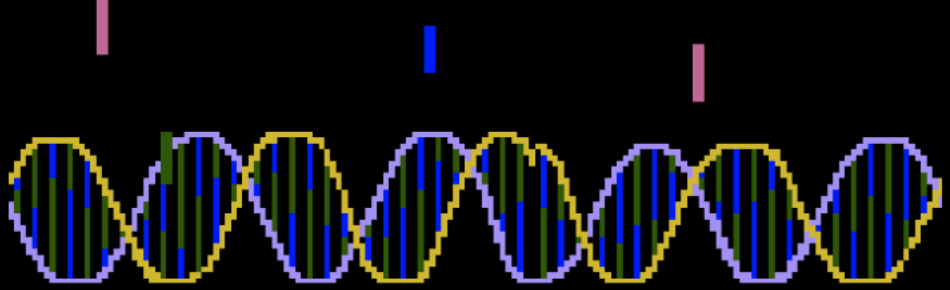
```
namespace color {
    //% fixedInstance whenUsed block="Deuteranopia"
    export const Deuteranopia = bufferToPalette(hex`
        dcbacb
        f72107
        f84f00
        ebc204
        00a426
        0022ec
        ff8552
        f2bd3b
        eee437
        4fde8f
        e396ca
        fe01aa
        dcbacb
        dcbacb
        dcbacb
        000000
    `);

    //% fixedInstance whenUsed block="Protanopia"
    export const Protanopia = bufferToPalette(hex`
        000000
        000000
        c56595
        ddb45a
        cd966f
        e0db4c
        d2b83f
```

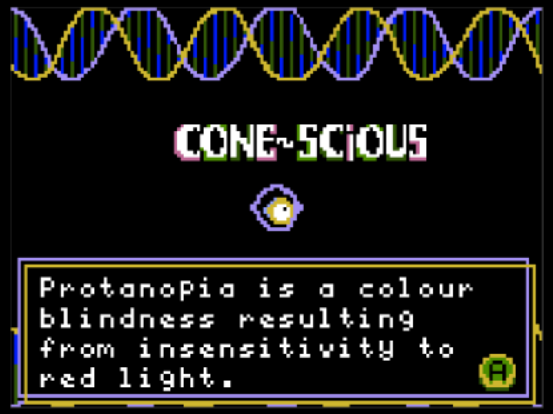
Game 2: Protanopia

2. Gameplay
The player controls the eyeball, navigating the DNA chains to collect red genes while avoiding incorrect ones.



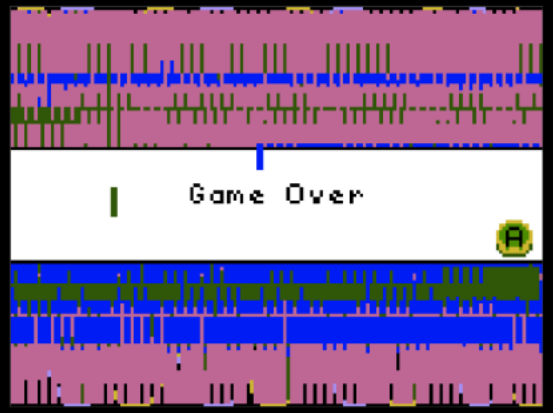
1. Intro
The start screen introduces Protanopia, and explains to the player about the gameplay.



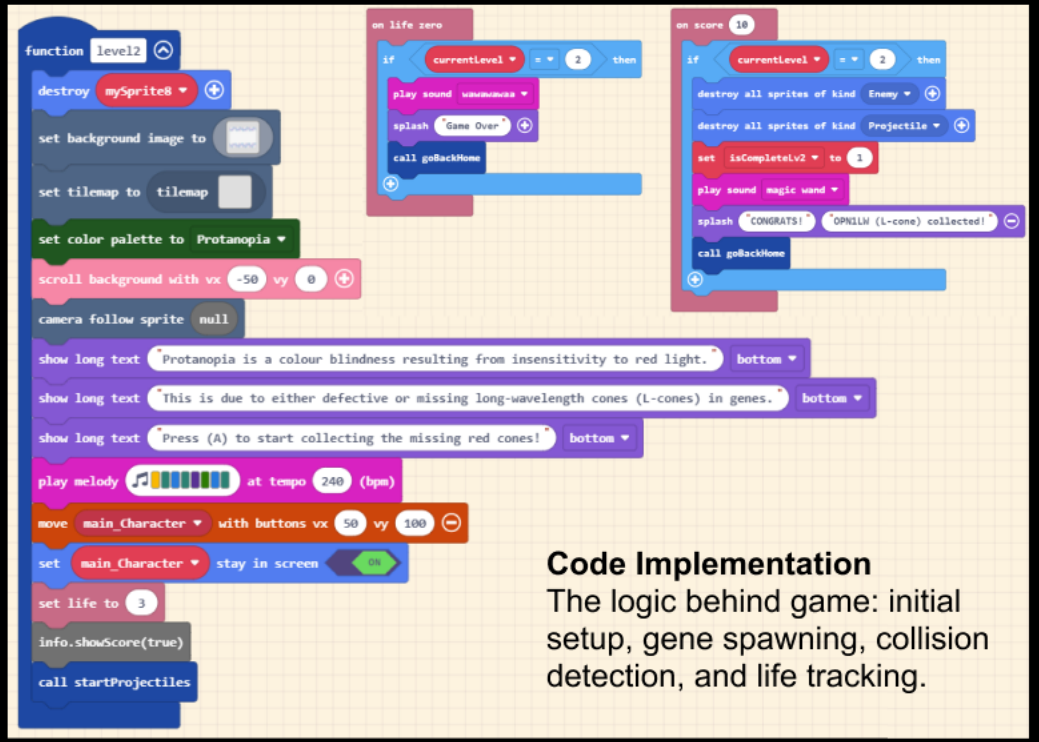


Concept and Gameplay
The second level, inspired by Space Invaders, focuses on Protanopia, or red-green colour blindness. The game design features a background of two DNA chains missing red genes, visually representing the condition. Players control an eyeball avatar to collect red genes while avoiding other genes, with three lives available. Losing all lives ends the game, while collecting 10 red genes restores the missing L-cone and related vision.

3. Lose
The player loses all lives.



4. Win
The player successfully restored L-cone and the colour vision for Protanopia.



Code Implementation
The logic behind game: initial setup, gene spawning, collision detection, and life tracking.

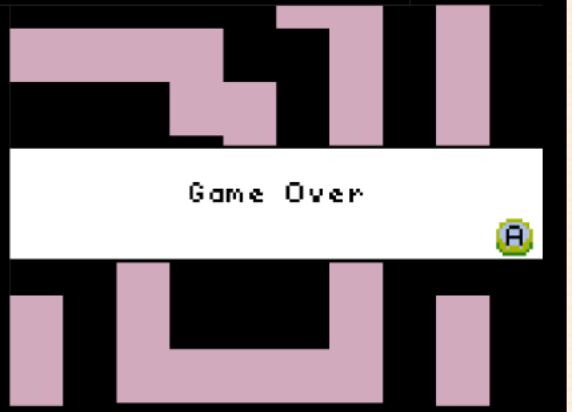
Game 3: Tritanopia

1. Intro
The start screen introduces Protanopia, and explains to the player about the gameplay.

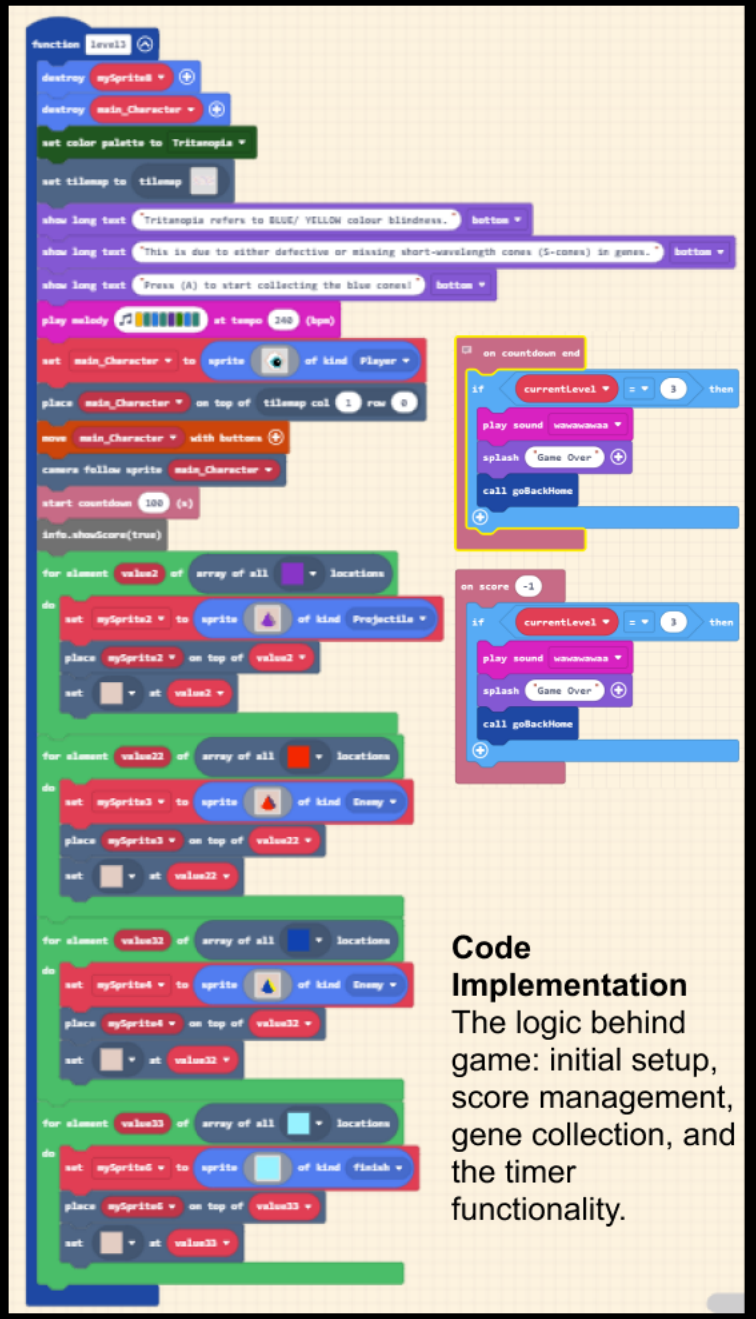
Concept and Gameplay
The third level centres on Tritanopia through a maze-style gameplay. Players are tasked with collecting the missing blue genes while finding their way out of the maze. Each correct gene adds one score, while wrong genes deduct one score. The player has 100 seconds to complete the maze; failure to escape or falling below zero score results in losing. Successful completion restores the S-cone and related vision.

2. Gameplay
The player navigates a maze, collecting blue genes and avoiding incorrect genes while racing against the clock.

4. Win
The player successfully restored S-cone and the colour vision for Tritanopia.

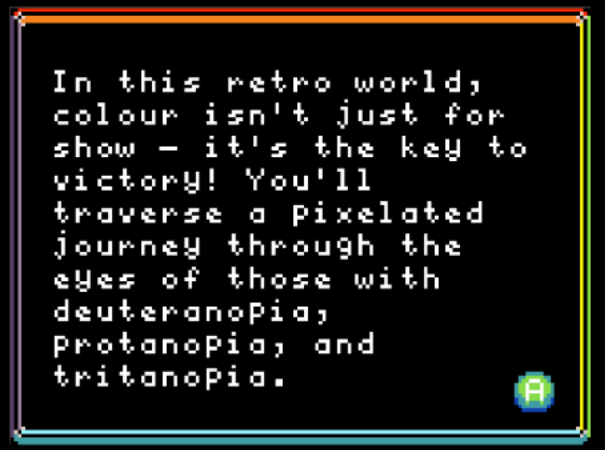


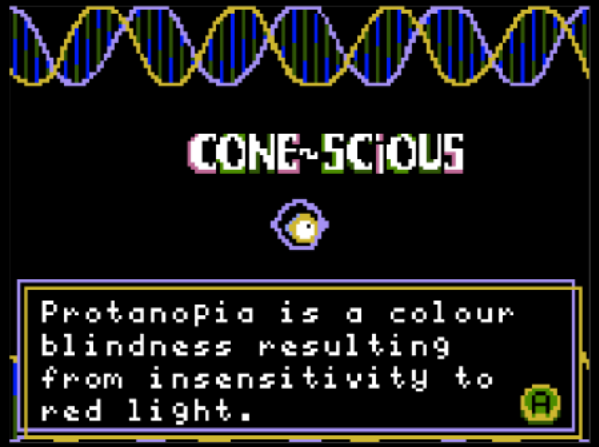
3. Lose
The score drops below zero or time runs out.

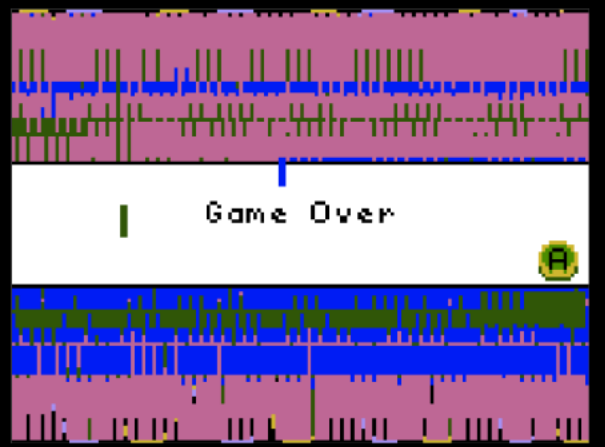


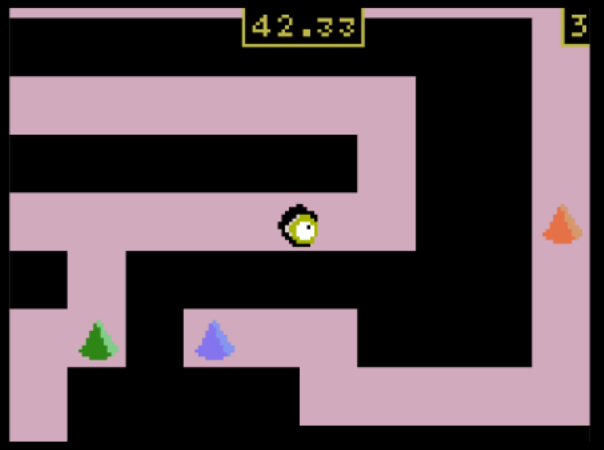
Code Implementation
The logic behind game: initial setup, score management, gene collection, and the timer functionality.

Result Showcase









Generative AI Historical Scene Explorer

MetaChronicle is an learning tool powered by generative AI, allowing users to explore events through varying perspectives and emotional lenses. Drawing on research into how perspective and emotion shape narratives, the project encourages critical thinking and deeper engagement.

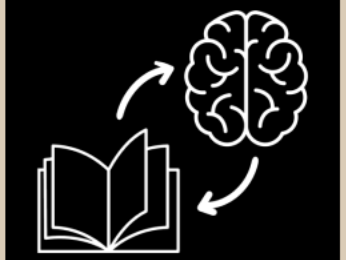
Tools:

Keywords:
#Generative AI #Interactive Storytelling #Emotional Engagement
#Critical Thinking #UI/UX Design

Website:
https://canacechen.com/metachronicle.html

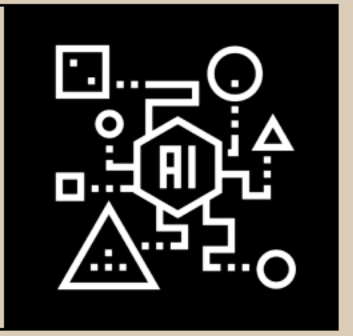
(Background image generated by Stable Diffusion 3)

Research



Interactive Storytelling and Emotional Engagement
Designing MetaChronicle's narrative approach involved blending interactive storytelling techniques that incorporate emotional resonance and shifting perspectives. Research into narrative theory and digital storytelling emphasises the importance of engaging users on both cognitive and affective levels (Ryan, 2006). By allowing users to experience historical events through multiple roles and emotional filters, the platform aims to enhance empathy and critical thinking. From an educational point of view, this approach also improves comprehension and retention, as "we feel, therefore we learn" (Immordino-Yang & Damasio, 2007, p. 5). Applying these insights, the design decisions included scene-by-scene narrative progression with viewpoint and emotional variability, thereby challenging preconceived notions and fostering a more nuanced, comprehensive understanding of the scenes (Wineburg, 2001).

AI-Driven Narrative Possibilities
Integrating AI-driven language and image generation models opened up new avenues for dynamic, customised storytelling. It enables narrative experiences that extend beyond pre-scripted sources of text and imagery, allowing for virtually infinite possibilities in constructing historical scenes and perspectives. Large-scale generative models can rapidly generate coherent and contextually appropriate responses, including both narrative elements and visuals, thereby streamlining the creative process (Radford et al., 2019; Ramesh et al., 2021). By leveraging these capabilities, the platform can offer personalised experiences for each user's selected event, perspective, and emotional filter, thus moving beyond static historical representations to a more fluid, responsive storytelling approach, while minimising production time and costs associated with traditional content creation methods (Katsamakas and Sanchez-Cartas, 2024).



Ethical and Societal Considerations in AI
Developing MetaChronicle required an awareness of the ethical and societal implications of employing generative AI for historical storytelling. Biases embedded in training data and the risk of misrepresenting marginalised voices demanded careful consideration (Crawford & Paglen, 2019). Additionally, AI-generated narratives might reproduce or challenge systemic inequities (Benjamin, 2019). These insights shaped the decision to incorporate multiple perspectives, prompt users to question their assumptions, and implement accessibility features. It also guided the content moderation strategies to mitigate misinformation and ensure that the platform promotes a respectful, inclusive representation of historical events.

Claim of AI Usage
This project used ChatGPT-4o API to generate perspective and emotion selections and suggestions, narratives, and prompts for image generation, and Stable Diffusion 3.5 to generate images for each scene and the website background image.

Platform Design

- An interactive tool that allows users to explore historical events through multiple perspectives and emotional filters.
- Users can experience stories from different viewpoints (e.g., soldier, civilian, leader) and emotional tones (e.g., fear, hope, anger).
- Combines AI-generated narratives and visuals, enabling deeper engagement and understanding of context and emotion.

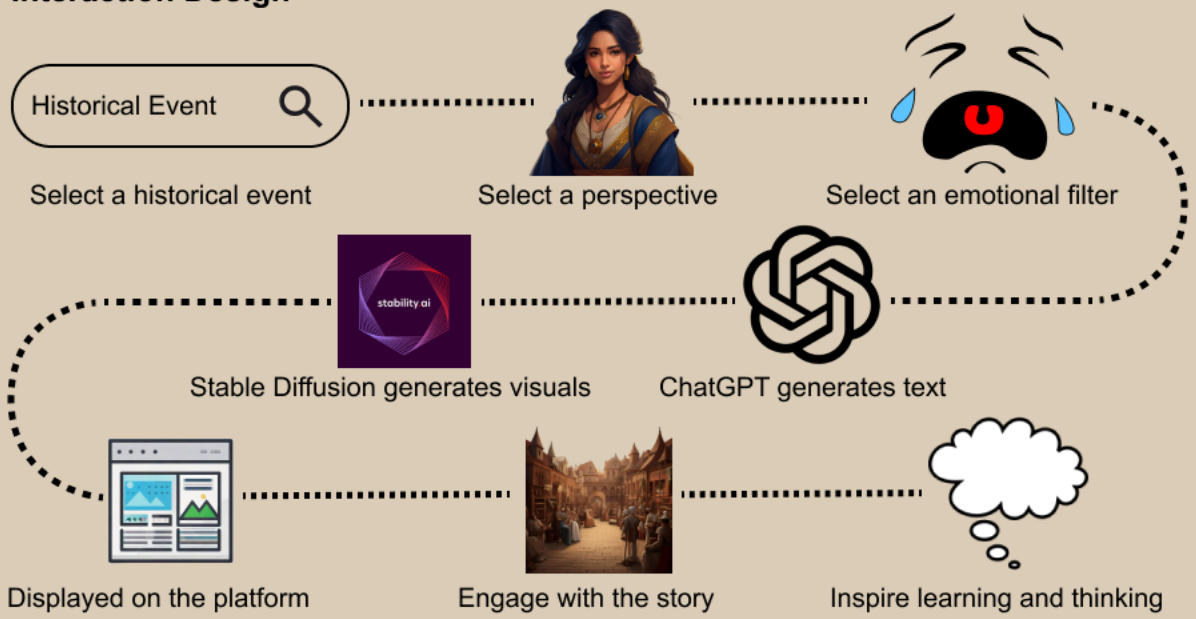
Primary users
Students, educators, history enthusiasts, researchers, and museum-goers.

Design for Different User Needs

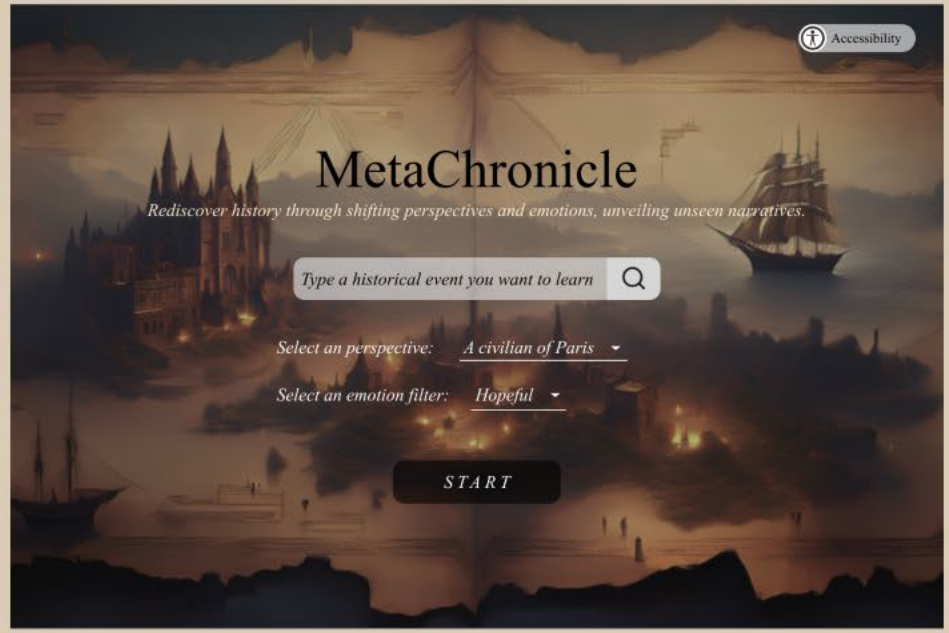
Age Groups	• Younger users: Simplified narratives, engaging exploration of historical events. • Adults/researchers: Detailed accounts, nuanced emotional filters, and deeper contextual information.
Level of Interests	• Casual users: Brief, engaging overviews with visuals and emotions. • Enthusiasts/researchers: Interactive deep dives with customisable content
Accessibility Features	• Visual/audio descriptions for visually or hearing-impaired users. • Simple controls for users with limited technical skills or disabilities.

Technical components
Frontend Interface (web platform/UI): HTML, CSS, JavaScript
Backend Server (application logic): Server-Side Framework (Express.js), Logic Layer
Generative AI Integration: Language Model API (ChatGPT), Text-to-Image Model API (e.g., Stable Diffusion)

Interaction Design

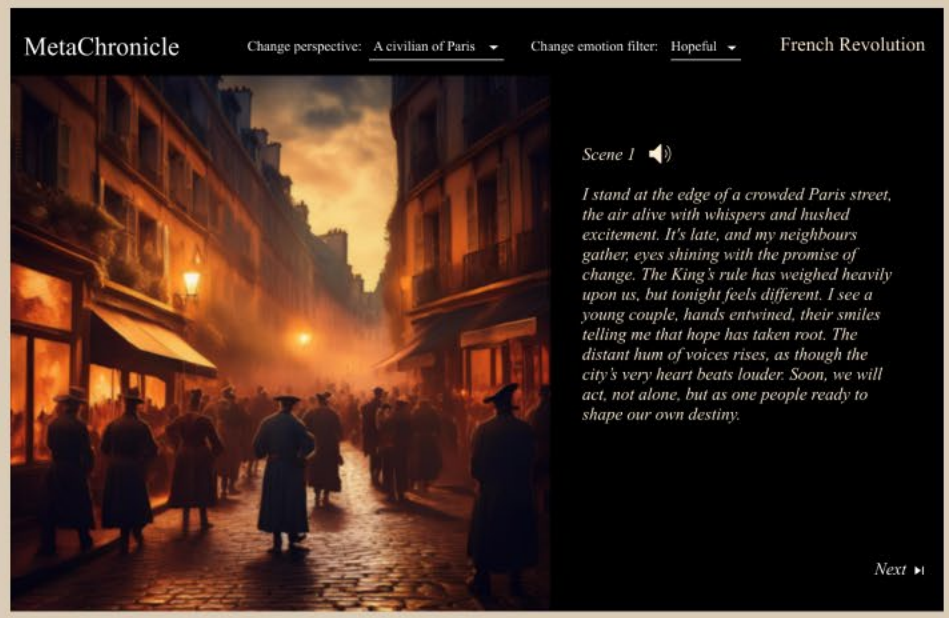


UX + UI Design



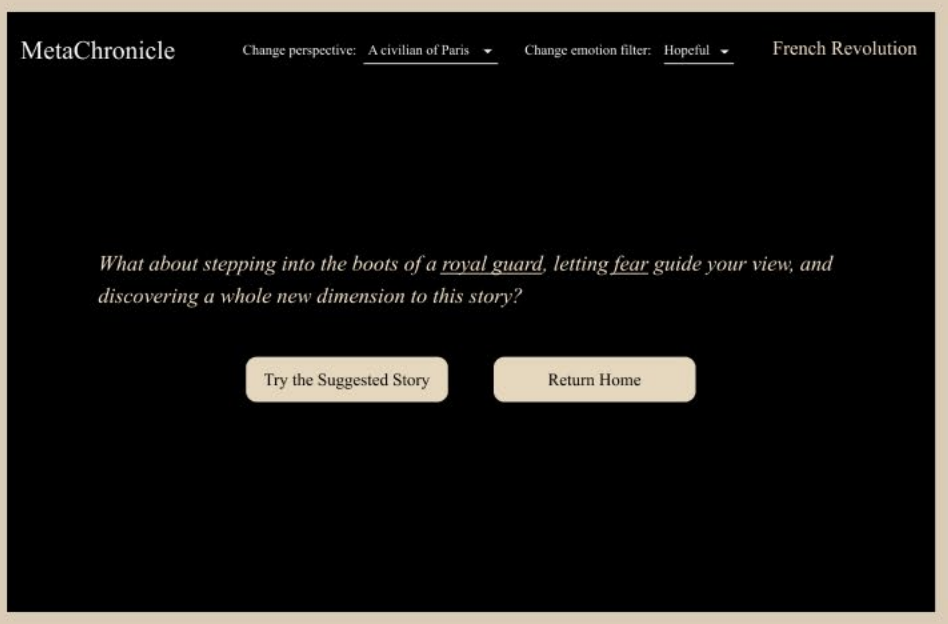
1. Select Your Experience
Choose a historical event, pick a perspective, and set an emotional filter. Press “Start” to begin the journey.

2. Adjust Accessibility
Before starting, refine the experience by changing content complexity, text size, or enabling voice-over or children’s mode. These settings ensure the experience suits personal needs.

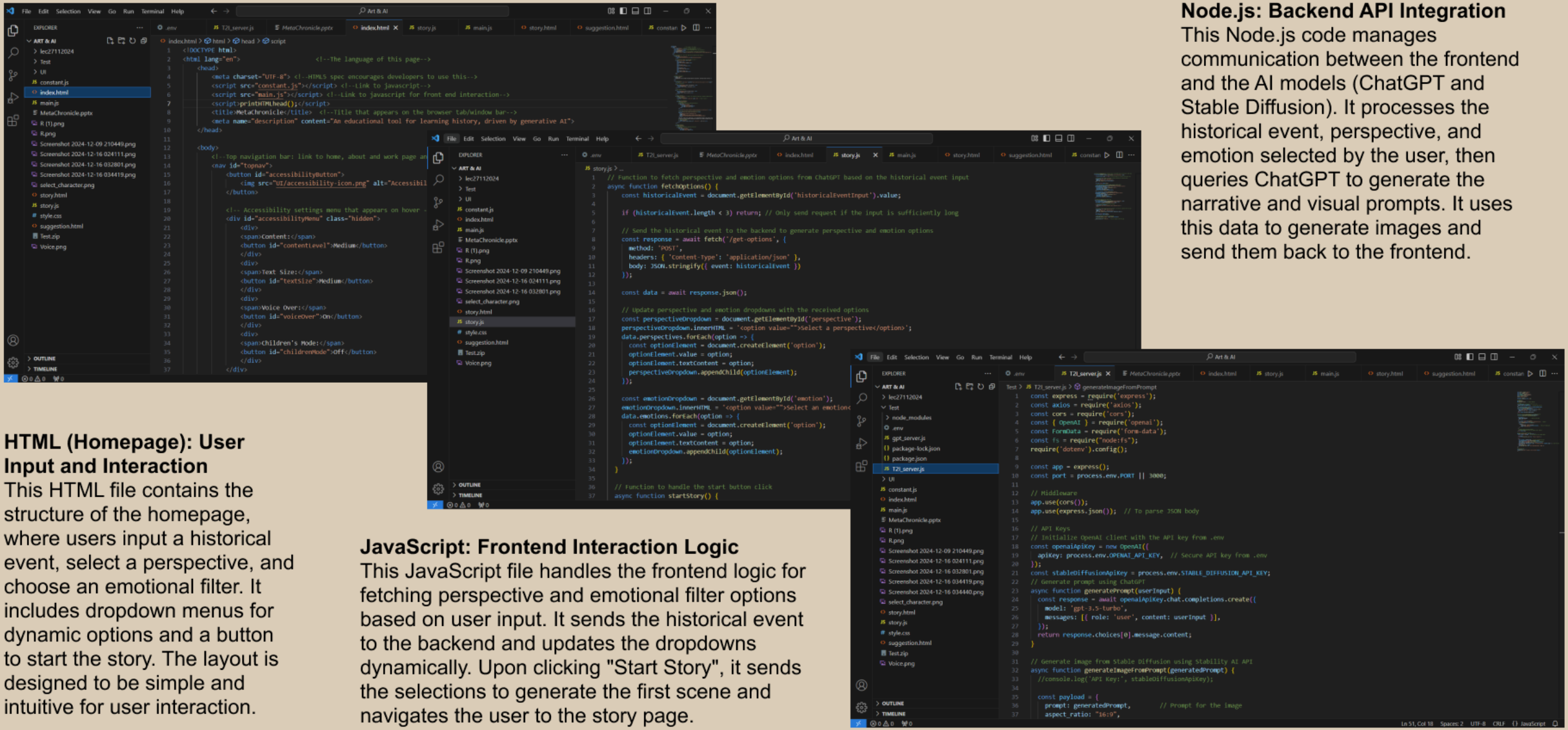


3. Immerse in the Story
As the story unfolds, see dynamically generated images with the narratives side by side. Voice-over, perspective, and emotional filters remain adjustable. Press “Next” to continue the story.

4. Explore Alternatives
At the end, a different perspective and emotional filter combination is proposed to challenge initial assumptions. User can choose to explore further, or return home.



Implementation



HTML (Homepage): User Input and Interaction
This HTML file contains the structure of the homepage, where users input a historical event, select a perspective, and choose an emotional filter. It includes dropdown menus for dynamic options and a button to start the story. The layout is designed to be simple and intuitive for user interaction.

JavaScript: Frontend Interaction Logic
This JavaScript file handles the frontend logic for fetching perspective and emotional filter options based on user input. It sends the historical event to the backend and updates the dropdowns dynamically. Upon clicking "Start Story", it sends the selections to generate the first scene and navigates the user to the story page.

Node.js: Backend API Integration
This Node.js code manages communication between the frontend and the AI models (ChatGPT and Stable Diffusion). It processes the historical event, perspective, and emotion selected by the user, then queries ChatGPT to generate the narrative and visual prompts. It uses this data to generate images and send them back to the frontend.

Result Showcase

MetaChronicle Change perspective: Mid-age Businessman Change emotion filter: Stressful The Great Depression

Scene 1

The city feels different today. As I step into my office, the once-bustling streets of New York seem quieter, almost suffocating. The news has already spread—the stock market has crashed. I can hear whispers from the halls. Investors are panicking. My stomach churns as I try to focus, but the weight of the situation presses on me. My fortune, my future, feels uncertain. The promise of prosperity now seems like a distant dream.

Next

MetaChronicle Change perspective: Mid-age Businessman Change emotion filter: Stressful The Great Depression

Scene 2

By noon, the office is eerily quiet. I can't shake the feeling of impending doom. Clients have stopped calling, and those who do are pulling back their investments. There's less work to be done, and more time to worry. My colleagues, usually so composed, now share looks of concern. I'm trying to hold it together, but the stress is beginning to show. Every phone call, every email feels like a reminder that this crisis is far from over.

Next

MetaChronicle Change perspective: Mid-age Businessman Change emotion filter: Stressful The Great Depression

Scene 3

The thought of losing everything keeps me awake at night. My home, my investments, my reputation—it's all slipping through my fingers. I lie awake in bed, staring at the ceiling, imagining the worst. The future looks bleak, and the weight of it all is unbearable. The noise of the city outside feels muffled, as if the whole world is closing in on me. The anxiety claws at my chest. What happens next?

Next

MetaChronicle Change perspective: Mid-age Businessman Change emotion filter: Stressful The Great Depression

Scene 4

I try to push forward, but it's difficult to find hope. The streets are filled with people who look as lost as I feel. We all walk with our heads down, carrying our own burdens. I try to keep my business afloat, cutting costs and hoping that something will change. But with each passing day, the burden of worry only deepens. My confidence is slipping, replaced by a constant dread of failure.

Next

MetaChronicle Change perspective: Mid-age Businessman Change emotion filter: Stressful The Great Depression

Scene 5

As weeks pass, the weight of the Great Depression still hangs over me. I take a moment on a quiet park bench, watching the city move around me, trying to find clarity. It's hard to escape the feeling of stress that has settled in my bones. But in this moment, I realize that the future may be uncertain, but there's still hope. I'm not alone in this struggle. Perhaps there's a way forward, even if I can't see it yet.

Next

MetaChronicle Change perspective: Mid-age Businessman Change emotion filter: Stressful The Great Depression

What about experiencing the Great Depression through the eyes of a young, unemployed worker, where hope and resilience shine through despite the hardships?

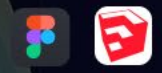
Try the Suggested Story

Return Home

Additional Works: Featured Professional Projects

This section highlights collaborative projects that combine interactive technology, gaming, and storytelling. Each project, developed in partnership with multidisciplinary teams, focuses on using technology to amplify messages through interactive and experiential approaches.

Tools:



Keywords:
#Interaction Design #Digital Activation #Game Design #User Engagement #UI/UX Design

Cisco Live Circuit Challenge

About:
An AR game showcasing the Cisco × McLaren partnership. Players see the driver POV through cameras on miniature cars, experiencing real-time, AR-enhanced gameplay with Mario Kart elements.

This is an activation for Cisco at Cisco Live 2024 Amsterdam.

Role:
Creative Technologist (at George P. Johnson)
I worked on the Ideation, Interaction Design, and Testing and On-site Execution.

More:

https://21020295.myblog.arts.ac.uk/2024/02/13/cisco_live_2024/

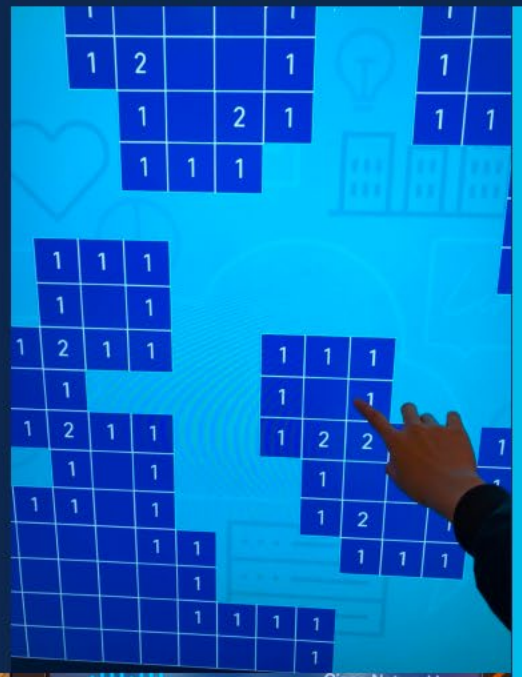
Cisco Networking Cloud Puzzle

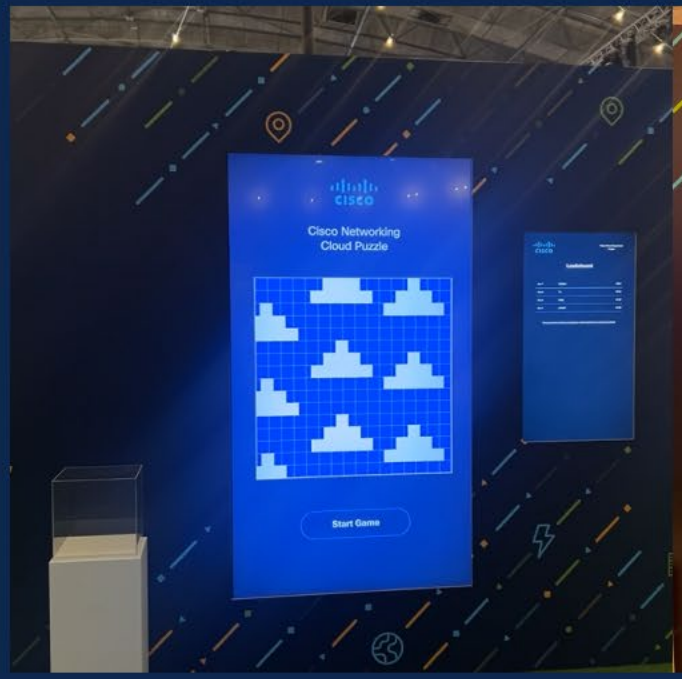
About:
The game combines trivia and strategy, where users unlock lives through answering a series of trivia questions, and navigate a tile maze to reveal a final image, highlighting Cisco's approach to simplifying multi-cloud environments.

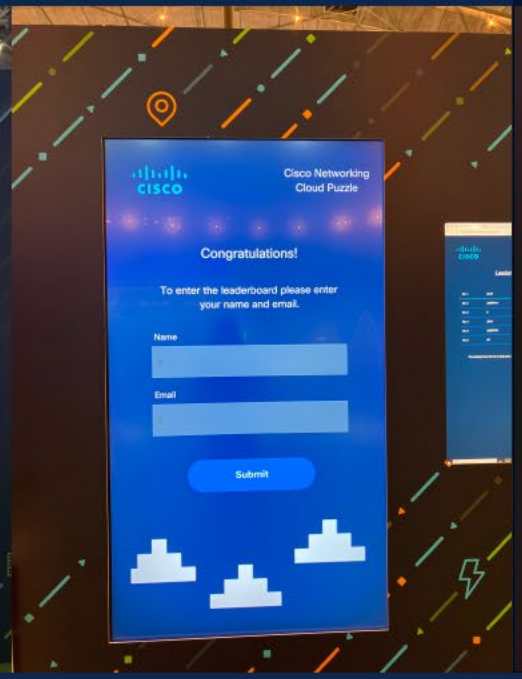
This is an activation for Cisco at Cisco Live 2024 Amsterdam.

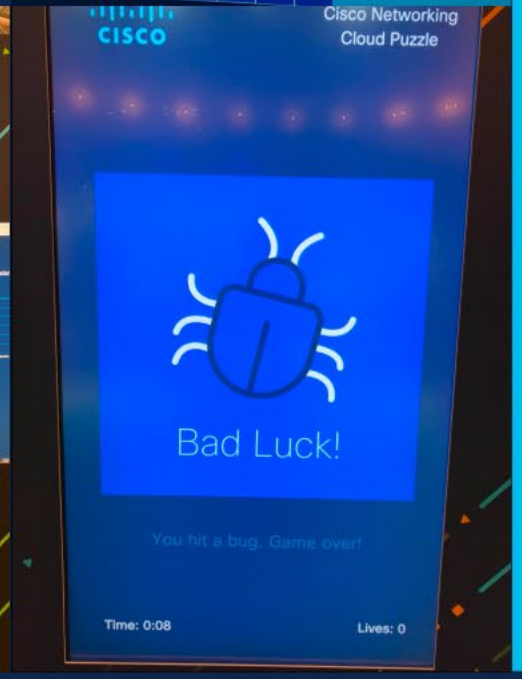
Role:
Creative Technologist (at George P. Johnson)
I worked on the Ideation, Game Design, and Testing and On-site Execution.

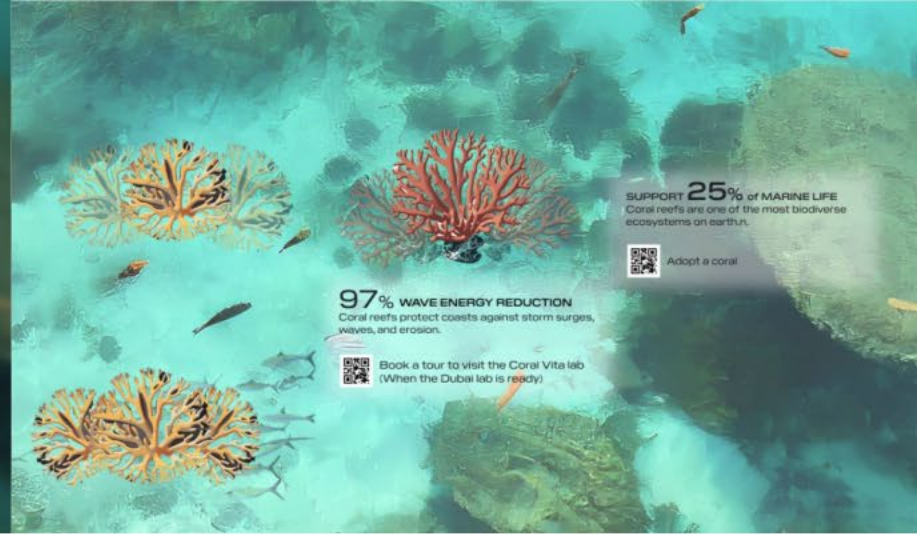
More:
https://21020295.myblog.arts.ac.uk/2024/02/13/cisco_live_2024/











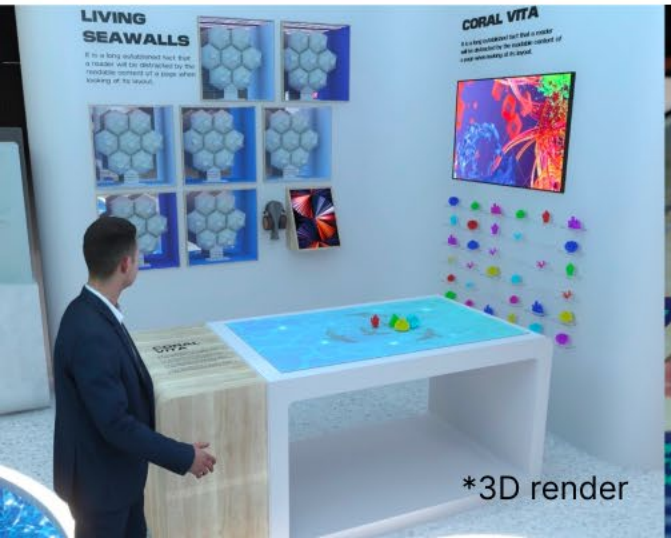
Coral Vita

About:
An interactive table that portrays a depleted underwater ecosystem, prompting the users to place coral models on top and witness the transformative power of coral restoration in action.

This is an activation for DP World at COP28 UN Climate Change Conference 2023.

Role:
Creative Technologist (at George P. Johnson)
I worked on the Initial Ideation, Interaction Design, UX and Testing.

More:
https://21020295.myblog.arts.ac.uk/2023/12/22/cop28_un_climate_change_conference_2023/



*3D render