

STARLIGHT SEIZE

Computer Graphics Project

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BE Third Year

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LIVE PROJECT PAGE

<https://starlight-seize.netlify.app/>

The completed project can be accessed live at the above mentioned link. Netlify has been used to make the project accessible online in order to help interact with its features and functionalities in real-time.

STORYBOARD



OBJECTIVES

1. To *tell a cohesive and engaging story through visual elements and animations*, guiding the viewer's attention and evoking emotions through the narrative of the UFO's encounter with the man, ensuring a compelling experience.

Situation	We aimed to create a captivating computer graphics experience depicting a man's abduction by a UFO, relying on visual elements and animations to convey a compelling narrative.
Task	To tell a cohesive and engaging story that guides the viewer's attention and evokes emotions through the narrative of the UFO's encounter with the man.
Actions	To achieve this, we crafted the visual elements, animations, and scene composition to unfold the story gradually. We integrated sound effects and music to enhance the storytelling.
Result	As a result of our efforts, the project successfully delivered an engaging narrative experience, immersing viewers in the storyline and evoking emotions such as curiosity, suspense, and wonder.

2. To develop *smooth animations* for dynamic elements such as clouds drifting, lights flickering, and the UFO's movement, ensuring seamless transitions to maintain immersion and engagement.

Situation	In pursuit of an immersive visual narrative, our project necessitated the creation of seamless animations for dynamic elements including drifting clouds, flickering lights, and the fluid movement of a UFO.
Task	To ensure seamless transitions and fluid animations to maintain immersion and engagement throughout the project, such as the animation of UFO arriving and departing, the movement of man towards the UFO, and the flickering of lights.
Actions	To achieve this, we employed advanced animation techniques and libraries, such as CSS animations and JavaScript frameworks, to create realistic motion effects. We carefully adjusted timing and keyframe animations to ensure smooth transitions between different states of the dynamic elements.
Result	The project delivered smooth animations for dynamic elements, including clouds drifting, lights flickering, and the UFO's movement. The seamless transitions between animation states enhanced immersion and engagement of the audience.

3. To utilize JavaScript to add *interactive elements*, allowing users to trigger specific actions such as hovering over the clouds to make them drift, clicking in the canvas to begin the animation or to click anywhere in the canvas to produce sound effects, enhancing user engagement and interactivity.

Situation	We identified the need to enhance user engagement and interactivity by incorporating JavaScript to introduce interactive elements. These elements would enable users to trigger specific actions within the scene.
Task	Our primary task was to utilize JavaScript effectively to implement interactive elements that would respond to user inputs. These elements included allowing users to hover over clouds to initiate drifting, clicking in the canvas to begin animation, and producing sound effects upon clicking anywhere within the canvas.
Actions	To accomplish this task, we meticulously designed event listeners and handlers in JavaScript to detect user interactions. Upon detecting these interactions, corresponding functions were executed.
Result	Users could now actively interact with the scene by triggering specific actions, thereby creating a more immersive and dynamic experience.

4. To *integrate sound effects* such as the turning on of an eerie music to complement the visual storytelling, UFO sounds for its arrival and departure, sound of the beam turning on to complement the visual storytelling, enhancing immersion and emotional impact.

Situation	We aimed to complement the visual storytelling with a range of sound effects, including eerie music for ambiance, UFO sounds for arrival and departure and the sound of beam turning on during key moments.
Task	To seamlessly integrate these sound effects into the project to enhance the overall storytelling experience. This involved selecting appropriate sound cues, synchronizing them with visual events, and ensuring they complemented the narrative effectively.
Actions	To address this objective, we embarked on a process to find the perfect sounds matching with the narrative, leveraging audio editing software, we precisely timed and synchronized each sound cue with its corresponding visual event.
Result	Users experienced a heightened sense of engagement as they were enveloped in the auditory ambiance of the narrative world.

5. To ***ensure compatibility*** with various web browsers, to deliver consistent performance and visual quality across different platforms.

Situation	Ensuring compatibility with various web browsers emerged as a critical objective as our goal was to deliver consistent performance and visual quality across different platforms, enhancing the overall user experience.
Task	Our task was to address the challenge of compatibility with diverse web browsers and platforms. This involved identifying potential compatibility issues, implementing cross-browser testing strategies, and ensuring consistent performance and visual quality across various platforms.
Actions	To tackle this objective, we adopted a comprehensive approach to browser compatibility, we implemented standardized code and employed modern web technologies that were widely supported across different platforms.
Result	Through our proactive efforts, the project successfully achieved compatibility with various web browsers, delivering consistent performance and visual quality across different platforms.

6. To ***optimize rendering performance*** to ensure smooth frame rates and consistent visual quality, especially during complex scenes with multiple animated elements, ***minimizing lag*** and providing a seamless viewing experience for users.

Situation	We aimed to ensure smooth frame rates and consistent visual quality, particularly during complex scenes featuring multiple animated elements. Our goal was to minimize lag and provide users with a seamless viewing experience.
Task	Our task was to optimize rendering processes, minimizing computational overhead, and streamlining animations to reduce lag and enhance the overall viewing experience for users.
Actions	To address this challenge, we opted for a simplification approach, we optimized animations and transitions to ensure smooth playback and consistent frame rates. By adjusting the timing and speed of animations, we aimed to achieve smoother frame rates and consistent visual quality, especially during scenes with multiple animated elements.
Result	Users experienced minimal lag and interruptions, resulting in a seamless viewing experience across various scenes and animations.

CHALLENGES & their easy FIXES

1. Browser Compatibility: Compatibility with various web browsers was challenging to achieve, as different browsers may interpret JavaScript techniques differently. Ensuring consistent performance and visual quality across different browsers require additional testing and optimization efforts.

Situation	Browser compatibility posed a significant challenge, differences in how browsers interpret JavaScript and rendering techniques introduced complexities that required additional testing and optimization efforts.
Task	Our task was to overcome the challenge of browser compatibility and ensure that the project performed consistently across different web browsers. This involved identifying compatibility issues, conducting thorough testing, and implementing optimizations to address browser-specific behaviours.
Actions	We conducted comprehensive testing across multiple web browsers, such as different laptops (HP, DELL) or including options like Google Chrome or Microsoft edge. We fixed the size of canvas , establishing a consistent canvas size provided a stable foundation for JavaScript execution.
Result	By implementing standardized coding practices and conducting rigorous cross-browser testing, we ensured broad compatibility for our project across various web browsers, resulting in a smoother and more consistent user experience across different browser environments.

2. Technical Expertise: Proficiency in JavaScript, including its libraries and frameworks, is essential for implementing interactive elements, animation controls, and sound effects effectively, which was little bit difficult as we have not used JS much before. Developing a complex computer graphics project may require a high level of technical expertise in areas such as graphics programming, web development, and multimedia design.

Situation	We had limited experience with the language and its libraries and frameworks, implementing interactive elements, animation controls, and sound effects effectively required a deeper understanding of JavaScript, which was initially challenging for us.
Task	Our task was to overcome the technical challenge posed by limited proficiency in JavaScript and develop the necessary skills to effectively implement interactive elements and animation features in the project as well as learn web development.
Actions	To address the challenge of technical expertise, we dedicated time to learning the fundamentals of JavaScript, we familiarized ourselves with popular JavaScript libraries and frameworks, we engaged in hands-on practice and experimentation with JavaScript by working on our project.
Result	Through proactive learning and practical experience, we successfully overcame the challenge of limited technical expertise in JavaScript. Our efforts to enhance technical expertise not only facilitated the completion of the project but also expanded our capabilities as developers.

3. Limited Interactivity: While the project may include interactive elements, the level of interactivity may be limited compared to standalone applications or games.

Situation	While the project included interactive elements such as triggering animations, the overall interactivity remained constrained.
Task	Our task was to address the challenge of limited interactivity and enhance user engagement within the project. It required exploring ways to augment interactive elements and provide users with a more immersive and engaging experience.
Actions	We expanded interactive features within the project to offer users more opportunities for engagement. This included adding interactive elements such as clickable objects beginning the animation and the sound effect , also the drifting of clouds by hovering over them.
Result	The project's enhanced interactivity increased user engagement and also enriched the overall user experience, leading to higher levels of satisfaction and enjoyment.

4. **Optimize rendering performance:** To ensure consistent frame rates, especially during complex scenes with multiple animated elements, *minimizing lag* to provide a smooth viewing experience.

Situation	Achieving consistent frame rates was crucial to providing users with a smooth viewing experience. However, minimizing lag and ensuring seamless rendering presented obstacles that needed to be overcome.
Task	Our task was to address the challenge of optimizing rendering performance to ensure consistent frame rates and minimize lag. It required implementing effective strategies to streamline rendering processes and enhance the overall viewing experience, especially during scenes with high complexity and animation intensity.
Actions	To optimize rendering performance, we opted for a simple yet effective approach by increasing the time function used in our animations. By adjusting the timing intervals for rendering updates, we achieved smoother animations.
Result	By increasing the time function in our animations, we successfully optimized the performance, leading to smoother frame rates and reduced lag, particularly in scenes with multiple animated elements.

5. **Instance Removal:** Implementing smooth UFO animations while ensuring seamless removal of the previous UFO instance on the canvas.

Situation	During the animation implementation for the UFO, a significant challenge arose when attempting to smoothly transition the UFO's movement while ensuring the removal of the previous UFO instance as clearing its previous positions presented difficulties.
Task	The task was to address the challenge by developing a solution to smoothly transition the UFO's position without leaving remnants of its previous location.
Actions	To overcome this challenge, we utilized the clearRect function to remove the previous instance of the UFO from the canvas before rendering the updated position, ensuring seamless animation transitions.
Result	The resulting solution enabled smooth transitions between the UFO's positions without leaving artifacts from the previous instance.

ASSETS AND SOURCE OF INSPIRATION

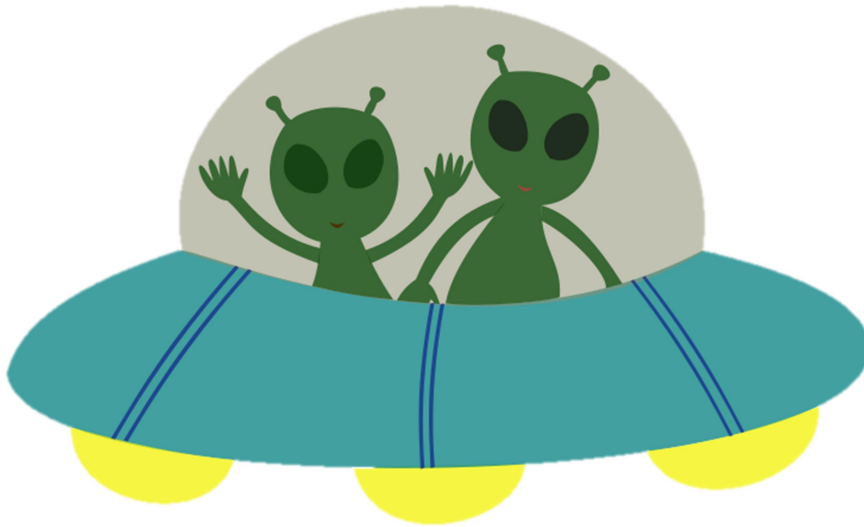
1. House: [\[Source - MotionArray\]](#)



2. Man: [\[Source - Shutterstock\]](#)



3. UFO: [\[Source - Freepik\]](#)



4. Clouds: [\[Source - Freepik\]](#)



5. UFO Sound Effect: [\[Source - Pixabay\]](#)

6. Beam Sound Effect: [\[Source - Pixabay\]](#)

RESOURCES

1. ***Inkscape***: Inkscape was utilized for tracing *assets* used in the project.
2. ***Pixabay***: *Sound effects* sourced from Pixabay helped in enhancing the auditory experience of the project.
3. ***Canva***: Canva played a significant role in designing the *storyboard* for the project.
4. ***Netlify***: Netlify served as the platform for *deploying* and making the project accessible online.