CMPE 491

SENIOR PROJECT 1

Project Name

Astroni

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1. Introduction

We are thrilled to provide an engrossing adventure game that our gifted team has painstakingly created in this report. Eldoria is a mystical planet that serves as the setting for a remarkable gaming experience meant to captivate and amuse gamers.

Players will assume control of a formidable warrior elf traversing a rich and magical realm full of obstacles, secrets, and excitement as they venture into the heart of Eldoria. Our game offers players an enjoyable and fulfilling experience by blending pleasure with worthwhile duties. It's not only about amusement either.

In this extensive guide, we will look at the special qualities and creative components that make our game different from others. Our product offers an immersive blend of education and entertainment, from interactive learning materials that are seamlessly integrated into the gaming experience to a gripping storyline that leads gameplay.

Our game is unique in that it has a progressively harder curve that is purposefully made to test and enhance players' abilities. Players will come across progressively difficult challenges as the game progresses, which promotes development and mastery and gives them every chance to get better.

We will discuss gameplay aspects as well as the significance of statistics and in-game feedback. Because they let players monitor their progress, draw lessons from it, and modify their tactics as necessary, these features are essential to enhancing the overall gaming experience.

This report is essentially a thorough manual for our adventure game, providing an insight into the unique enjoyment of Eldoria and its interesting environment. Come along on this incredible adventure with us as we reveal the mysteries, difficulties, and delights that gamers may expect from our immersive gaming environment.

1.1 Purpose Of The System

With the main objective of giving players an engaging and unforgettable gaming experience, the "Astroni" game fulfills a number of functions, including entertainment, storytelling, puzzle-solving, character interaction, and artistic expression.

1.2 Design Goals

Immersive storytelling: It is to craft a compelling story that captivates players' emotions and attention. To increase player involvement, design objectives should center on telling an engaging and well-paced story that uses the mythology of Astroni as a major motif.

Strategic Puzzle-Solving: Create difficult riddles and exploration components that force players to use critical and strategic thinking. This will lead to strategic puzzle-solving. The intention is to deliver a gratifying gameplay experience that strikes a balance between player accomplishment and difficulty.

Dynamic Character Interactions: Create a mechanism for dynamic character interactions wherein the relationships and decisions made by the player affect how the tale develops. The main objective of design should be to create a branching, responsive story that takes player decisions into account.

Visual and Aesthetic Consistency: Ensuring a visually coherent and aesthetically beautiful 2D pixel graphics style is crucial for the entire game. To preserve Eldoria's fantastical feel, design objectives should include rules for animations, art materials, and overall visual presentation.

Integration of Guidance and Mentorship: To offer guidance and mentorship, smoothly incorporate the sage and wise character into the gameplay. The main objective of design should be to make sure the sage is a useful tool without taking away from the player's ability to make decisions for themselves.

Meaningful Conflicts and Resolutions: Design interactions with characters in search of Astroni's ability to provide significant conflicts and resolutions. The intention is to craft significant and unforgettable moments that challenge the protagonist's morality and determination while giving gamers a feeling of satisfaction.

Player Agency and Choices: Give player agency top priority by creating decisions that influence the story. Set design objectives for decisions that result in a variety of outcomes, promoting replay ability and a customized gaming experience.

Balanced Difficulty Curve: A balanced difficulty curve should be created for all aspects of the game, such as fighting, exploration, and puzzles. The major objective of design should be to create a demanding game that is nonetheless playable by a large variety of players.

Exploration and Discovery: Encourage players to explore and discover the game world by include secret regions, lore, and hidden areas. The intention is to provide gamers who are genuinely interested with more content and a more comprehensive grasp of the Eldoria universe.

Technical Stability: Establish design objectives pertaining to maximizing game performance, reducing bugs, and resolving any potential Unity Game Engine problems to guarantee technical stability and fluid gameplay.

Sound and Music Integration: To improve the game's overall mood and emotional impact, design objectives should include the use of sound effects and music.

1.3. Definitions, Acronyms, and Abbreviations

Definitions:

Pixel Art: A form of digital art where images are created at the pixel level, often with a limited color palette. It's commonly used in 2D game development for a retro or stylized aesthetic.

Unity Game Engine: A popular cross-platform game development engine that allows developers to create 2D and 3D games. It provides tools for graphics, sound, physics, and more.

Top-Down Adventure: A game perspective where the camera is positioned above and looks down on the game environment. This perspective is common in adventure games and allows players to see the entire play area.

Narrative Exploration: The process of uncovering a story through gameplay, encouraging players to explore the game world to discover plot points and lore.

Replayability: The degree to which a game encourages players to replay it, often achieved through multiple story paths, varied outcomes, or additional challenges.

Acronyms and Abbreviations:

RPG: Role-Playing Game.

NPC: Non-Player Character.

AI: Artificial Intelligence.

HUD: Heads-Up Display, which shows important information on the screen during gameplay.

FPS: Frames Per Second, a measure of how smooth and fluid the animation appears in a game.

GUI: Graphical User Interface, which includes on-screen elements like menus and buttons.

QA: Quality Assurance, the process of testing a game to identify and fix bugs and ensure it meets quality standards.

UI: User Interface, the visual elements that allow players to interact with the game.

CPU: Also referred to as the Central Processing Unit, or "brain" of the system, the CPU is an essential piece of hardware. It performs necessary functions for calculation and control.

GPU: GPU stands for Graphics Processing Unit, a piece of hardware made to process.
and show visuals on screen. It is especially designed to render images quickly. Still, it enables high-performance parallel computing when used for general-purpose computations. Computations that must be done.

1.4 Overview

Combining aspects of storytelling, puzzle-solving, character interaction, and exploration in the engrossing world of Eldoria, the game seeks to provide a delightful and enjoyable experience. A captivating and engaging game experience is provided by Emelcuil's quest to discover Astroni's mysteries, which incorporates player agency, complex relationships, and strategic decision-making. The game's fantastical premise is complemented by thoughtfully created visual and aural elements.

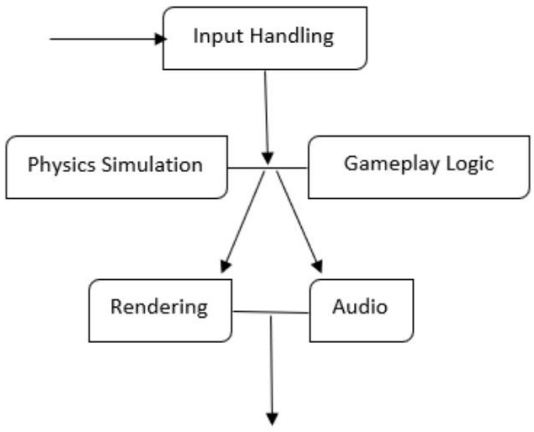
2. Proposed Software Architecture

2.1. Overview

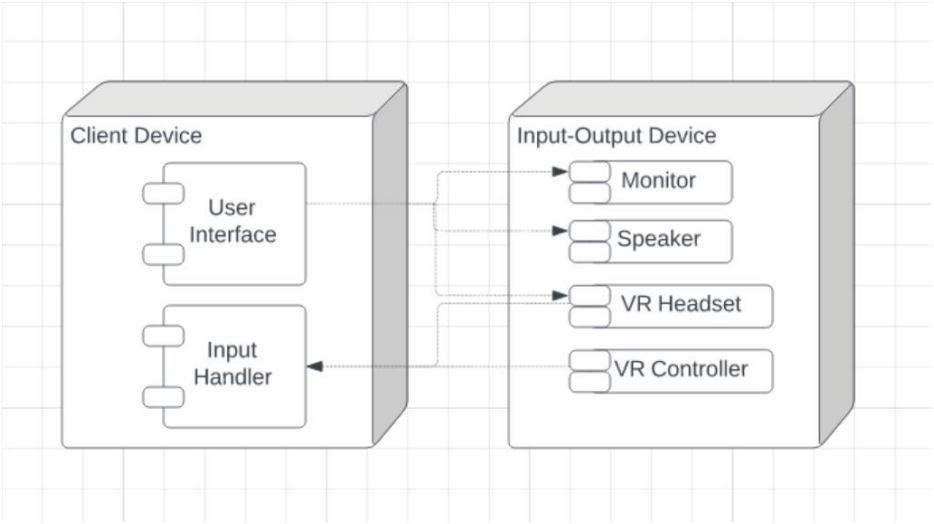
The intended "Astroni" software architecture is made to work with the Unity Game Engine to produce a solid and seamless gaming experience. The architecture is modular, with important parts handling specific areas of the game's creation. The main engine, Unity, offers capabilities for physics, game logic, and visual rendering. Scene management handles the seamless transitions between scenes, and the storytelling module controls the dialogue and dynamic branching narrative systems. A varied and captivating gameplay experience is made possible by the algorithms specifically designed to handle character interaction, puzzles, and objectives. The audio module adds immersive sound effects and music integration, while the art and animation pipeline keep the pixel art approach constant. Important factors to consider include scalability and extensibility, which allow for the easy addition of new material, regions, and characters. This architecture, supported by C# scripting and version control through Git, aims to create a flexible and collaborative framework for the development of "Astroni."

2.2. Subsystem Decomposition

The subsystem breakdown of the game "Astroni" outlines a structured approach to handling its various features. Using the Unity Game Engine, the Game Engine Integration Subsystem manages the core operations of the game. Scene Management makes it easier to move between Eldoria's various locations smoothly. The dynamic branching narrative is skillfully woven by the Storytelling Subsystem, which also handles character interactions and conversation. Character Interaction makes ensuring that objectives and relationships react to player decisions in a dynamic way. The subsystem responsible for integrating various obstacles and advancing the game is the Puzzle and Quest Subsystem. The Sound and Music Integration Subsystem improves the immersive experience, while the Art and Animation Pipeline Subsystem preserves the pixel art style's visual coherence. AI, UI, and Player Input and Controls subsystems work together to provide responsive and interesting gameplay. Finally, the foundation for upcoming additions is supplied by the Scalability and Extensibility Subsystem. This thorough subsystem breakdown creates a distinct hierarchy that promotes cooperation between development teams and helps make the "Astroni" game a reality.



2.3. Hardware Software Mapping



2.4. Persistent Data Management

One of the most important components in the "Astroni" game architecture that guarantees the player experience's continuity and customization is the Persistent Data Management subsystem. This subsystem includes a Save and Load System that lets users save important game states, decisions, and places so they may continue playing during sessions. By enabling users to create, remove, and switch between profiles, player profile management enhances customized game experiences. To foster a sense of accomplishment, quest and achievement tracking makes sure that active quests and achievements are persistently recorded. For consistent user experiences, the Configuration Settings component maintains player preferences, including display and sound settings. Sensitive player data is protected by the subsystem's use of data encryption to solve security issues. Players' acquired items and inventory are guaranteed to stay intact between sessions thanks to the management of inventory and item persistence. In addition, if desired, players can access their saved games on many devices thanks to support for cloud integration. All things considered, the persistence and customization of the "Astroni" gaming experience depend heavily on the Persistent Data Management subsystem.

2.5. Access Control and Security

Since separate material won't be served to different users, authentication and login are not required. All players who purchase the game through Steam can access it. The game progress of the player is kept either locally or on the Steam Cloud. However, no security steps are made to hide the data because only the game progress will be logged, and no personal information will be used.

2.6 Global Software Control

Since our project is an adventure game, it has an event-driven system, which regulates the game's progression based on modifications to its states. The game begins with a variety of events that the player will encounter and respond to in order to change the game's trajectory. The player will be presented with several options in each scenario, and the game will branch out into other states based on the option selected.

2.7 Boundary Conditions

Three unique boundary conditions are used in the game: Failure, Termination, and Initialization. Each has a distinct function within the gameplay experience.

a. Starting up: When the game first launches, the user is presented with two menu screens: the choice to begin the either to launch a brand-new game or to access their previously saved progress in the game. Should the If the player decides to carry on where they left off, they will do so. preserved the previous match. If a player wants to or is starting to play the game for the first time, when the user launches a new game, they must first finish the game's tutorial before beginning the match.

b. Termination: By pausing the game while playing, the user can access an in-game stop menu. Should the If the player so chooses, they can use this option to end the game. The game will save itself automatically. if the player decides to log out of the game.

c. Error: If an unforeseen glitch results in the game abruptly closing, the player's progress is retained in part because the auto-save system is in place. Since the automatic saving method will execute on a regular basis, guaranteeing that the user's progress up to the most recent auto-save is maintained even if the game abruptly ends.

3. Subsystem Services

Within a broader software system, the term "subsystem services" usually refers to the functions or services that each subsystem offers. Each subsystem provides unique services that together improve the overall operation and user experience of the "Astroni" game. Let's examine a few of the essential subsystem functions:

Graphics Rendering: Oversees the rendering of animations and pixel art assets in graphics rendering.

Physics simulation: Manages interactions, collisions, and movement in the virtual environment.

Input Handling: Handles player input from different devices to operate the avatar.

Scene Loading and Unloading: Oversees the changes between Eldoria's many locations.

Environment Initialization: Configures each scene's starting point for the game environment.

Dynamic Branching Narrative: Implements a method for dynamic storytelling based on decisions made by the player in the Dynamic Branching Narrative.

Dialogue Management: Character interactions, dialogue, and story progression triggers are all managed via dialogue management.

Relationship Tracking: Tracks relationships between the player character and non-player characters (NPCs).

Quest Dialog Systems: Implements dialogue and quest systems, as well as mechanisms for managing quests and character interactions.

Puzzle Creation & Integration: Constructs and incorporates a range of puzzles into the game.

Quest Progression: Controls how a quest advances in response to user choices. Include game state loading and saving. Player profiles and preferences are managed by profile management.

Creation of Pixel Art materials: Facilitates the development and incorporation of pixel art materials.

Animation Systems: Puts systems in place for animating environments and characters.

Sound Effect: Integrates sound effects according to events that occur during gameplay.

Background music: It is in charge of incorporating music to improve the ambiance as a whole.

Input handling: handles user input for moving and interacting with characters.

Control Configuration: Players can personalize their control choices with the Control Configuration feature.

NPC Behavior: AI behaviors for non-player characters are implemented by NPC Behavior.

Decision Making: Controls how NPCs make decisions and respond to the player.

Menu Systems: These systems put in place menus for player interaction and navigation.

Save and Load Functionality: Game states can be saved and loaded using the save and load functionality.

Profile Management: Player profiles and preferences are managed by profile management.

4. Glossary

Pixel Art: A form of digital art where images are created at the pixel level, often with a limited color palette, commonly used in 2D games for a retro or stylized aesthetic.

Top-Down Adventure: A game perspective where the camera is positioned above, looking down on the game environment, common in adventure games.

Eldoria: The mystical world in which the game is set, featuring diverse races and regions, and home to the legend of the lost star Astroni.

Emelcuil: The protagonist, a young and adventurous elf who embarks on a journey to uncover the truth behind the legend of Astroni.

Branching Narrative: A storytelling technique where the plot unfolds differently based on player choices, leading to multiple possible outcomes.

NPC (Non-Player Character): Characters controlled by the game's artificial intelligence rather than by the player.

HUD (Heads-Up Display): The on-screen display that provides important information to the player during gameplay, such as health, inventory, and objectives.

DLC (Downloadable Content): Additional game content that can be purchased or downloaded after the initial release.

5.References

https://www.thegamer.com/fantastic-top-down-isometric-rpg-games-ranked/#littlewood

https://gameranx.com/features/id/297282/article/the-top-13-best-top-down-rpgs-that-are-absolutely-incredible/

https://later.com/social-media-glossary/npc/

https://www.hp.com/us-en/shop/tech-takes/what-is-dlc-in-gaming