

CMPE 492
SENIOR PROJECT 2



Project Name

Astroni

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1. Introduction

1.1 Purpose

The purpose of this report is to provide an overview of Astroni focusing on its architecture and design as well as the broader impact of the engineering solutions, on a global and social level. The intention behind this document is to communicate the aspects of the project to stakeholders' members of the project team and potential users.

1.2 Scope

This report covers the concluding phases of Astroni providing information about its system architecture, design decisions and the wider effects brought by the engineering solutions implemented. Moreover, it delves into the social implications of this PC game experience highlighting its significance, in entertainment domains.

2. System Overview

2.1 Project Background

Astroni is a 2D top-down pixel art adventure game designed to provide a unique experience with the player's fun in mind. Developed for computer platforms, the project aims to attract users' attention through puzzles and gameplay mechanics and provide an interactive and entertaining experience.

2.2 Key Features

Puzzles: small interactions designed to keep the player more involved in the game

Game Mechanics: Includes mechanics such as interacting with objects, combat, and movement.

Interesting Story: An interesting story set in the world of Eldoria.

2.3 Target Audience

The target audience for this game include nostalgic gamers who appreciate pixel art and classic game mechanics, adventure enthusiasts drawn to its mysterious storyline and expansive world, challenge-seekers who enjoy navigating through treacherous dungeons and overcoming formidable foes, strategy aficionados who relish in devising tactics during combat and solving intricate puzzles, pixel art enthusiasts who admire its retro aesthetic, cross-platform gamers who enjoy playing on various devices, and creative players who are interested in using the game's integrated assets and tools to craft their own gaming experiences.

2.4 Platforms

This game is available on a variety of PC platforms, catering to the diverse preferences of gamers. Whether you prefer playing on Windows **or** macOS you can enjoy this captivating adventure on your desktop or laptop computer. With seamless integration across different operating systems, players can immerse themselves in the pixelated world of Astroni regardless of their preferred PC platform. The game's compatibility with a wide range of PC configurations ensures smooth gameplay experiences, allowing players to delve into the depths of dungeons, unravel mysteries, and engage in thrilling battles with ease. Explore the ancient ruins, conquer formidable foes, and uncover the secrets of Emelcuil's journey on your preferred PC platform.

3. Final Architecture and Design

3.1 Overview

The final architecture and design of Astroni represent a culmination of meticulous planning, iterative development, and a commitment to delivering a seamless user experience.

This section provides an overview of the overarching structure and design principles that shape the PC environment.

3.2 Subsystem Decomposition

In this section, Astroni will be broken down into its various subsystems. Each subsystem represents a functional component of the game and outlines how these components interact. This decomposition simplifies the development process and allows for independent testing of each subsystem.

3.2.1 Player Control System

Movement Controls: Handles player movement on the screen using standard control schemes such as arrow keys or WASD.

Interaction System: Allows the player to interact with objects in the game world, such as opening doors, picking up items.

Animation Controls: Manages the movement and interaction animations of the player character.

3.2.2 Enemy AI System

Patrol AI: Enables enemy characters to patrol along a set route.

Chase AI: Causes enemy characters to follow the player when they come within a certain distance.

Attack AI: Manages enemy attacks on the player.

3.2.3 Combat System

Attack Mechanics: Includes mechanics for the player to attack enemies, which may involve melee or ranged combat.

Health and Damage Management: Manages the health points and damage taken by both player and enemy characters.

3.2.4 Inventory System

Item Management: Stores and manages items collected by the player, including using, discarding, or equipping items.

Equipment System: Allows the player to use various equipment such as weapons, armor, and other gear.

3.2.5 Quest System

Quest Management: Tracks quests given to the player and their progress.

Quest Completion: Provides rewards to the player upon completing quests.

3.2.6 Environment Interaction System

Navigable Areas: Determines which areas of the game world the player can access.

Dynamic Environment: Manages changes in the environment, such as opening hidden passages.

3.2.7 Audio System

Background Music: Manages background music that plays throughout the game.

Sound Effects: Includes sound effects for player and environment interactions, such as footsteps, attacks, and ambient sounds.

3.2.8 UI System

HUD (Heads-Up Display): Displays player information such as health, inventory, and current quests.

Menus and Interfaces: Provides interfaces for accessing options, inventory, and other game features.

3.2.9 Story System

Story Progression: Manages the progression of the game's narrative, including cutscenes, scripted events, and story triggers.

Character Development: Handles character arcs, plot twists, and other story elements that drive the player's engagement.

3.2.10 Tutorial System

Tutorial Prompts: Guides the player through basic game mechanics and controls when starting a new game.

Progressive Tips: Offers contextual tips and hints as the player progresses through the game to introduce new features or challenges.

4. Impact of Engineering Solutions

The impact of engineering solutions in Astroni extends beyond technical considerations, encompassing both global and social dimensions. This section examines the broader implications of the project's engineering decisions, highlighting the positive influence on a global scale and the societal changes that may result.

4.1 Global Impact

Cultural Impact: Astroni's world and story open the doors to a different fantasy universe for players. This universe enchants players with ancient elf mythology and fantastical adventures. The game's popularity across different countries where players have diverse cultural and mythological backgrounds can foster interest in different cultures.

Technological Impact: Being built on the Unity 2D platform, Astroni showcases the potential of this platform to game developers and designers. This highlights Unity's capabilities in 2D game development, potentially inspiring future game development projects.

Community Effect: The game can foster a community among players. Players can share tips, develop strategies, and even create fan-made content. This community interaction can help build connections among players and contribute to the continuous development of the game.

Artistic Influence: Astroni's pixel art style can boost interest in pixel art. The visual aesthetic of the game may steer artists and game developers towards pixel art, contributing to a revival of pixel art.

4.2 Social Impact

Social Inclusion and Diversity: Astroni's popularity and accessibility across different demographics can foster social inclusion and diversity within gaming communities. The game's engaging storyline and inclusive gameplay mechanics provide a common ground for players of various backgrounds to interact and connect with each other.

Community Building: Astroni's multiplayer features and online forums can serve as platforms for players to form communities, share experiences, and forge friendships. This fosters a sense of belonging and camaraderie among players, transcending geographical boundaries and creating social networks beyond the game.

Education and Learning: Astroni's storyline and gameplay elements can serve as educational tools, sparking interest in history, mythology, and language among players. Through exploring the game's lore and deciphering Ancient Elvish texts, players can engage in informal learning experiences, expanding their knowledge and cultural understanding.

Empowerment and Representation: Astroni's protagonist, Emelcuil, represents a strong, independent character in the gaming world. Her journey from confusion to empowerment resonates with players, particularly those who identify with her struggles and triumphs. By portraying diverse characters and narratives, Astroni contributes to the broader movement towards representation and empowerment in gaming.

Social Responsibility and Activism: Astroni's themes of exploration, discovery, and overcoming challenges can inspire players to apply these principles to real-world issues. Through in-game decision-making and problem-solving, players may develop a sense of social responsibility and agency, leading to increased awareness and activism on important social issues.

5-Contemporary Issues

5.1-Finding suitable assets for the game

Finding suitable assets for a game like Astroni is a multifaceted process that requires careful consideration of various factors. Maintaining consistency in visual style across characters, environments, and items is essential for coherence in the game world. Compatibility with the chosen game engine, such as Unity, is crucial to ensure seamless integration and optimal performance. We also navigate legal considerations by obtaining assets with proper licenses to avoid copyright infringement issues. Balancing the quality of assets with the available budget is important, especially for indie developers or small studios. Flexibility in customization options can enhance adaptability to specific needs, while leveraging resources from the game development community, such as asset marketplaces or forums, can provide valuable support and collaboration opportunities. Through thorough research and consideration of these factors, we find assets that elevate the visual appeal and gameplay experience of our game Astroni.

5.2-Gameplay mechanics and globality

Developing gameplay mechanics with global appeal is a pivotal aspect of creating a successful game like Astroni. Ensuring that the mechanics are engaging and accessible to players from diverse cultural backgrounds is key to achieving global popularity. Incorporating intuitive controls and gameplay systems that are easy to understand yet offer depth and complexity can cater to a wide range of players. Additionally, considering cultural sensitivities and preferences when designing game mechanics can help avoid alienating certain player demographics. Implementing multiplayer features or competitive elements that encourage social interaction and competition can further enhance the game's global appeal by fostering a sense of community and camaraderie among players worldwide.

6-New Tools and Technologies Used

6.1- Unity 2022

We wanted to develop our game in Unity because the inclusion of Unity in our toolset offers various advantages that significantly increase the development and performance of our game. One of Unity's greatest strengths is cross-platform support. It allows us to develop our game for VR headsets like Oculus Quest 2, PCs and potentially a variety of platforms. This feature allows our game to reach a wider audience. Additionally, Unity's Asset Store is a valuable resource that provides access to a large library of assets, tools, and plugins. This resource was instrumental in improving the visual features of our game.

8-Test Cases and Results

Test case 1: Testing of gameplay mechanics

In-game movement mechanics have been tested in this case. It has been observed whether these mechanics will challenge the user. Potential problems or bugs that may arise have been observed. It is aimed that the mechanics of the game will not be too challenging for the user and will appeal to the general audience. During the testing phase, this situation was carefully examined and the necessary feedback was received from the users. The test was completed successfully. As a result of the feedback received, minor changes were made and the mechanics were redesigned.

Test case 2: Testing the usage mechanics and interface of the computer in the game

In this case, the usage mechanics and interface of the computer in the game have been tested. It was observed whether the mechanics of the computer on which the player in the game would perform the tasks were working. In addition, in this case, it was observed whether the interface of this computer was difficult to use by the public. Additionally, it was observed whether users were using this computer. The test was completed successfully. As a result of feedback received from users, improvements were made to the computer interface.

Test case 3: Testing performance and compatibility

In this case, optimization of game performance and compatibility between hardware and software configurations were tested. This test was carried out to ensure that users do not experience any performance problems while playing the game. Because the game contains performance problems, which affects the player's enjoyment of the game. As a team, we tested the elements that could cause problems during the testing phase and the situations that would affect the performance of the game so that users could get the maximum benefit from the game. For example, we tested whether the computer the player would use in the game responded to the player's commands without delay. As a result, the test was completed successfully. As a result of the tests, necessary adjustments were made to increase performance.

Looking at the general tests, care was taken to ensure that the mechanics of the game appeal to the general audience and can be easily applied by the general audience. Care was taken to ensure that the interface of the game was attractive to users. Additionally, it was observed whether the visual objects used in the game were tiring for the user. The performance of the game has been tested and the performance problems that users may experience while playing the game have been reviewed. Necessary changes were made in line with the feedback obtained because of the tests.

9-User Manual

9.1- Starting and Setup



Figure 1: Main Menu

After starting the game using the .exe file users can reach for the options and play menu.

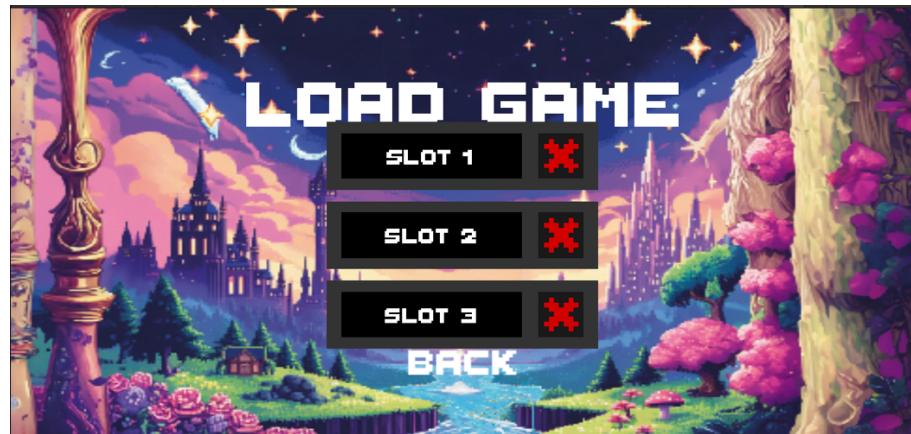


Figure 2: Play menu

The users can load a previous gameplay by saving in game or creating a new save.

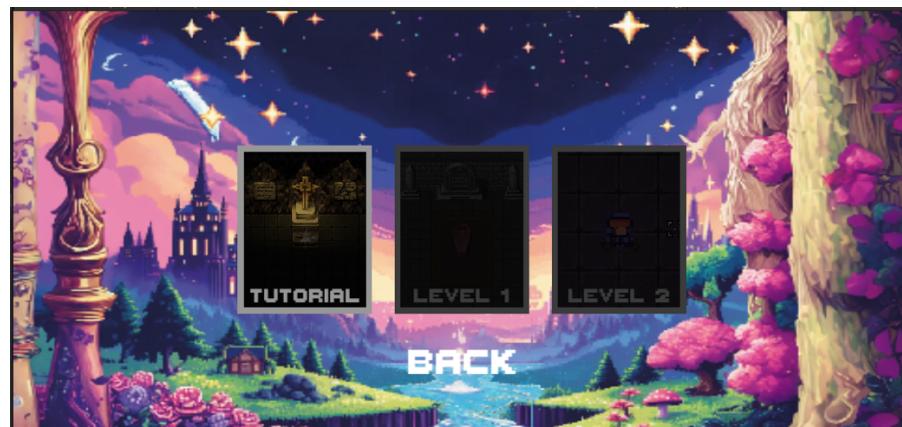


Figure 3: Choose level

Users can choose to start a previous or next level from this panel

9.2 Gameplay and Mechanics

9.2.1 Controls:



Figure 4: Tutorial Screenshot

Movement: WASD

Basic attack and special skill: Left-Right Mouse Click

Pick Up Item: E

Interact: Q

Pause: Esc

9.2.1 Mechanics:

In our game there are 3 different classes for different gameplay each one has a unique special skill. Player can move and attack with the weapon equipped. Players can collect items and interact with the environments.



Figure 5: Fight Mechanic



Figure 6: Inventory System Mechanic