



Senior Design Project Report COMP491

Advisor: Tuna Çakar

Atakan Ermete, 041601023
Muhammed Rahmetullah Kartal, 041701008
Zeynep Ayyüce Çay, 041601021

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Abstract

Unlike the common 2D story-based games that are in today's game market, the aim is to bring a different perspective to the market by supporting the in-game quests by Artificial Intelligence (AI) and story flow according to the decisions made by the player during the game.

Keywords: 2D, Story flow, AI, Role Play Game (RPG)

1. Introduction

1.1 Motivation

The main motivation to start this project is the group members' desire to create a game and a story due to their interests and imagination.

1.2 Economic Aspects

The project doesn't have an economic income expectation, the main idea is launching game on different computer platforms and to be accessible by other players.

1.3 Content

The content is designed to express effects of war on human psychology, ideas, and life standards. To better express these effects game and environments going to be designed as three different parts, first part takes the middle of war and the problems that it causes as the topic from the perspective of a soldier, in the continuation of the story the psychological effects and disappointments of the first episode is dealt with, at the end of the fiction with the concentered emotions which are decided by the player, the alternative endings came up.

1.4 Artificial Intelligence

The role of AI in the game is giving a challenge to player in different side and main quests like the 3x3 isolation game. Almost all these quests are going to be compulsory to achieve full progress in story, and level of AI is going to change related to player's decisions and play style.

1.5 Tool Requirements

Adobe Photoshop: For environment and character designs.

Unity: Animations, scene designs and main game.

C#: Coding Language

2. Project Definition and Planning

2.1 Project Definition

This game is a story-driven 2D RPG set in an imaginary universe. In the game you play as a soldier of American army against Nazi Germany in WW2 to complete quests in the story to reach multiple endgame scenarios.

2.2 Story

The first scene starts with hope about the end of the war, soldiers are talking about that situation, but all hope ends with a sudden attack to second facade of American Army inside Nazi Germany area, this facade doesn't have concrete buildings. Before that attack soldiers are training in different zones of facade, this scene is about basic quick tips about playstyle and conversations of our two main characters (old man [Gerard] and young one [Sam]), on these conversations Sam realizes that Gerard have some problems about remembering things, because of that he gives a photo of himself to Gerard in that day.

At the night of the day that attack happens by enemy planes, as soon as Sam wakes up he runs out of the tent checks for Gerard's tent and realises that he is missing, after that he tries to help other soldiers and sees injured commander, takes a command from him and starts his first actual quest about ringing the alarm and communicating third facade about situation.

After finishing these quests and saving people, Sam still worries about Gerard and returns to second facade which is officially under invasion of enemy, in some area which is close to that facade he finds Gerard. Gerard remembers him and talks about the plan he made for that they need to split up, this part has two different stories for each main character and we are going to play them one by one, also they will have quests together.

In the middle of this plan, enemy soldiers notices our main characters and starts shootings, one of the characters is going to be shot but the screen will be almost fully blurred and we won't be able to see who is shot.

After some time we are going to play with Gerard while he is running away from area without Sam, after some time he will be out of breath and going to faint in a secure place, after that scene we will see that Sam got shot and enemy soldiers around the body, they will leave him by thinking he is dead, after a while he will wake up with a injured body and goes to a German city after change his uniform. Besides all that he thinks that Gerard has left him and runaway, but at the same time he thinks if he is in Gerard foot, he will probably do the same thing.

The main story starts in the German city, Sam is going to try to get himself a new life, he is going to work in a casual job, with the time he will get the news about end of war and victory of Germany, he is going to fall in love with a girl named Elizabeth in this period. With some of the side and main quests he can be able to find gifts for Elizabeth or useful goods for himself, for example after a game against ai in city taverna, if he can do enough success against ai he will get two tickets for a prom, on this prom scene we are going to see how is their relationship going to move on (player will decide that by his/her decisions).

On some of the parts Sam will realize that he is not able to do some of the things that he can do before that injury, but he won't mention this situation to anyone. After all these it will come out that Elizabeth's father is one of the commanders which saw Sam's dead body, but he won't understand that because of time past and changes on the Sam.

One day Elizabeth mentions about a man ,which his father trying to catch, to Sam and shows the photo of him, after a little shock Sam realizes that the person in photo is himself, then starts thinking about Gerard, he thinks Gerard is probably captured by enemy and they took his photo from Gerard's backpack.

Because of recent events Sam decides to avenge and does little sabotage operations while everything was on the rail. After successful sabotages Elizabeth's father understands that Sam is responsible for all that, but he doesn't reveal this situation. At the end of all these sabotages Sam decides that he did take revenge of Gerard, but it is too late for everything because Elizabeth's father threatens Sam, with his own daughter's life. This is the last decision of the game, player can save Elizabeth but not Sam, can lose both or save both, it is all about understanding the trick in the story, because all of the scenes, including Sam's first injury is a dream of Gerard, actually we are playing the Gerard's ideas in Sam's body.

There will be more signs to make player realize that everything is a dream.

2.3 Quest Types

- **Main Quests**

These quests are mandatory to pass levels and will be in interaction with the main story. For example in the main quests we will take a command from injured commander, our mission is ringing the alarm, but the bell on the bell tower will be broken because of a shrapnel, we will find 3 different parts of this bell on the main facade zone. On each bell part we will face with a challenge, like take it from the behind of tree, or clean the rubble on the area to pass to the destination tent, after combining all parts we will be able to call soldiers to watchtower.

As a different example of main quests, commander will send us to communication tent, we need to solve the puzzle in that tent by checking documents, environment etc. For example, we will find 2, 3, 7 numbers from documents after checking the map on the wall, we will be able to find coordinates of third facade.

- **Side Quests**

Side quests are not mandatory to pass levels, but they may affect the scenario like, on the first scene before the attack a nurse and soldier will stay under a tree, and will have a romantic talk, we will be able to see all these but we can pass too, after the attack nurse is going to be running in screams to somewhere, if we follow her we will see that a tree fall down to soldier and nurse couldn't help him, that's why she is screaming, if we save the soldier we can easily get the bell part which is in the main quest, or it may have different effects like that.

- **AI Oriented Quests**

One of the most important parts in the game is AI, because they will be the actual challenges, as we mentioned in introduction we can give 3x3 Isolation Game example for that, the main idea of the game is making enemy unable to move.



Figure 1: First move of Isolation Game

As you can see in the Figure 1, we played bottom left and AI played middle.



Figure 2: Second move of the Isolation Game

In figure 2, we played top left and he played top right.



Figure 3: Third move of Isolation Game

In figure 3, we played top middle and he played, middle right.

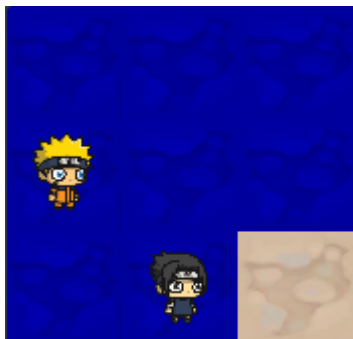


Figure 4: Fourth move of the Isolation Game

In figure 4, we played middle left, he played middle bottom. After all this we don't have any moves left but he does so he won.

We will reedit and attach this isolation game to main story like, in a sabotage mission we will be in a building which has 3x3 rooms, each room will have a camera system to see our last moves, and to make a move we will do a mini-game which can be an AI game or a normal game, these games will have time limitations like in every 1 min AI will play its move, also it will do a move after our each move, also these games are going to be played in mini computers, if we win room is going to be sabotaged successfully, if we can't we will be able to try again in the declared amount of time. The main idea to pass level is sabotaging rooms successfully to win or stay alive some amount of moves against AI.

Instead of just this isolation game we will have different types of AI's too, like a board game in the tavern or an AI agent that rethrows bombs that we threw to him by checking old thrown positions.

2.4 Project Plan

The expectations planned for this project are as follows. First, at the beginning of the project, all the group members were assigned to create the game characters. After that, it was decided that the main characters were Muhammed Rahmetullah Kartal, the side characters Zeynep Ayyüce Çay and the elements in the environment were drawn by Atakan Ermete these tasks also include animations. In the next task, the drawings approved by all group members were clarified, so far it has come as planned and we also designed some of the AI agent's like 2x3 isolation game with minimax algorithm, and started and finished most of the 3x3 code.

In the next missions, all the characters in the game we designed and the tools that should be in the environment, tree, tent, etc. and since it is known that the whole story in the game will consist of three main parts, it is the main plan to complete the tasks and cut scenes in the first part until the end of the first semester.

After achieving these goals, the team is going to start the design of AI agents and artworks.

2.5 Designs



Figure 5: Old Man - Gerard



Figure 6: Nurse



Figure 7: A Random Soldier



Figure 8: Commander



Figure 9: Soldier Tent



Figure 10: Commander Tent



Figure 11: Communication Tent



Figure 12: Equipment Tent

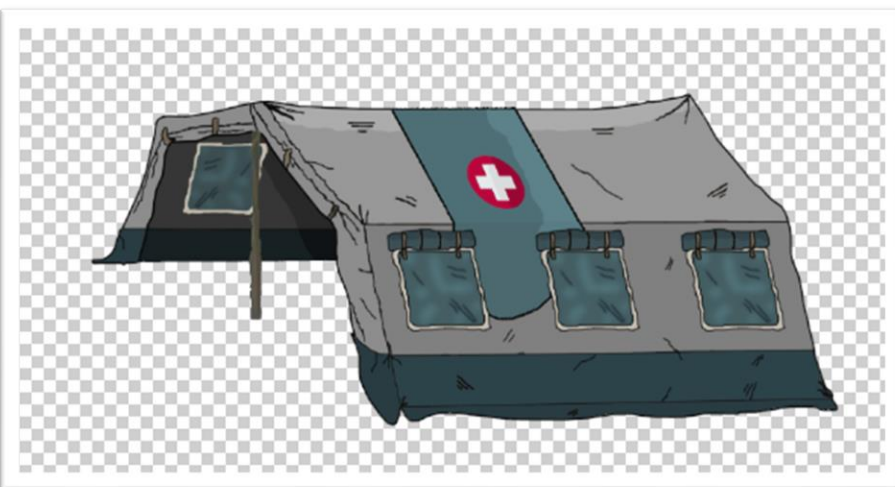


Figure 13: Medic Tent

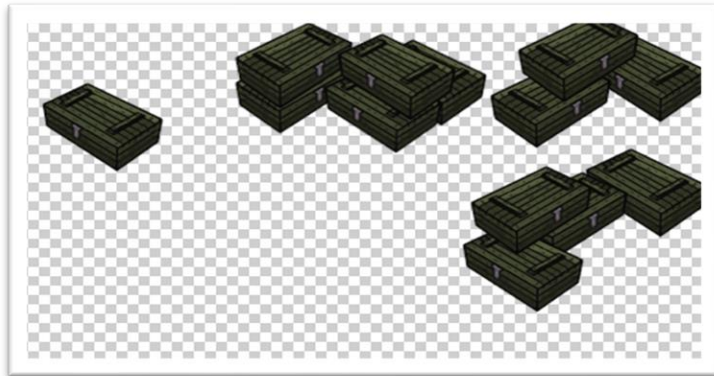


Figure 14: Boxes for Environment

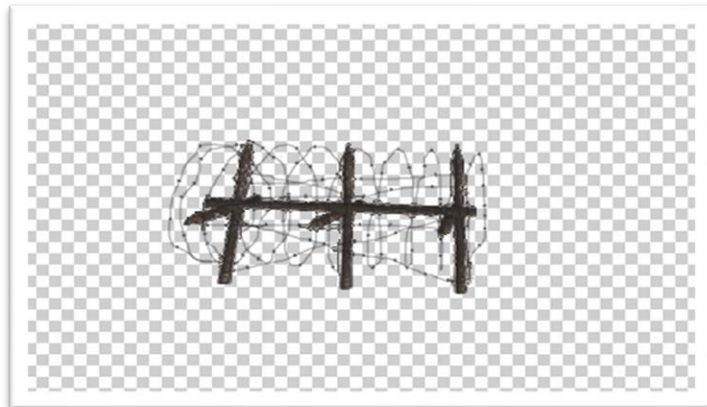


Figure 15: Barbed Wire



Figure 16: Background

3. Conclusion

By completing this project, we are going to learn importance of teamwork, timing, and selfless working. Since the start of project all the team members are trying to learn photoshop (artworks), unity(animations) and C# coding principles while studying on different Artificial Intelligence models, ideas. While doing these processes watched a lot of videos from YouTube and found good models from different movies, games etc. On the teamwork part we tried to share artworks and animations equally because we were all new to these ideas.

4. References

All done by imagination.