CENG 490

Senior Project

GOSOft

“Multi-3D”

Project Proposal

by

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Project Proposal

Name of the company: GOSOft

Group members:

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Project leader: is responsible for the project's overall progress, organization. Gives feedback to other members about their progress.

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Recorder: is responsible for taking the minutes of every meeting. A good observer and an analyst.

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Research coordinator: is responsible for coordinating research activities among the group members. Puts his innovation into leading the research to different but necessary areas.

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The devil's advocate: is responsible for criticizing the ideas discussed during the meetings and bringing new approaches to the project.

Other minor roles are presented in a matrix form.

	Optimist	Timekeeper	Gatekeeper	Initiator	Summarizer
Cincioğlu	X			X	
Akyüz	X	X			
Babur				X	X
Aluç			X		X

Project Topic: MULTI3D

For this topic, a massively multi player online game is to be implemented. The game is capable of supporting more than a hundred online players simultaneously. This implies that a strong network architecture is essential for a working product. Thus, before proceeding with any design procedure, an in-depth analysis of existing architectures is essential.

Furthermore, the online players in the game are expected to interact with each other. This is actually the key point in producing a game that can attract a large number of people. For this purpose, the game should provide facilities in which one player's action should affect others'. However, the desired condition is that the scenario or the concept of the game **forces** the players to interact. Although, it is true that the server will suffer more from this functionality, as it is a necessity it cannot be neglected.

In cases when there are not so many connected users, the game is responsible for the generation of possible AI players. Since the number of human players is quite changeable, supplementary AI is absolutely necessary to compensate the lack of interaction and to provide continuity. Moreover, AI players are expected to add some flavor into the game.

The game will be played in a 3D atmosphere that is rendered as realistic as possible. A good network architecture that separates graphics rendering from the game engine, or equivalently in this case the client module from the server, allows high-quality 3D graphics to be created and to be played without much of a network concern.

Current State-of-Art

The current Massively Multi player Online Game (MMOG) market is dominated by Role Playing Game (RPG) and First-Person Shooter (FPS) games. There are also a few examples of strategy games in this field. Since implementing multi player online games in a 3D environment is a difficult task, the examples of 3D MMOG games are limited, most of them being commercial. The reason why MMOGs have become popular is that a person can play this game with other people and even his/her friends interactively. The 3D feature is an add-on to the environment. In this market, creative ideas are more likely to survive since they have a capability of leaving a strong impact. We believe that our idea, whose details are provided below, is innovative in this respect, especially regarding the standard approaches.

Overview

We are planning to implement an adventure game from the first person's point of view. The scenario is based on the movie "The Cube[1]" in which the actors are trying to get out of a n*n*n dimensional building which consists of lots of cube shaped rooms. Furthermore, on regular intervals, the cubes in the construction change their position. In order to move through the cubes and hopefully get out of the construction, the players need to collaboratively solve some predefined puzzles. The players solve the puzzle by interacting with the objects inside the cube. It is important to note that the actions performed might or might not lead to a solution, however in either case every player will have something to learn from. There will be both human as well as AI players in the environment. To exchange ideas, the players will be able to chat freely with other human players and in a restricted manner with the AI players.

Graphics Aspect

The graphics engine will support 3D view of the cube and the objects and the players inside the cube. As the cube shall be observed from the first person's perspective, the view will change based on the player's location. The cube and the objects in it will be rendered as realistically as possible. However, how good the players can be rendered will be determined after a detailed complexity analysis. In the worst case, it is guaranteed to provide some humanoid models. Furthermore, based on the players' interaction with the objects, the visual changes in the environment will be instantaneously (in a reasonable amount of time) visible to all players in the cube.

Network Aspect

At this point, we are planning to design a client-server network architecture. The goal of the design is to minimize client-server interactions so that at least hundred players can be supported. We are planning to put as much elementary data as possible to the client application so that only dynamic values need to be exchanged for the game play.

In order to achieve our goal, a comprehensive research on the existing network models, client-server architectures, example massively multiplayer online games will be conducted. After the research, by choosing the most appropriate model and making the necessary trade-offs, the above constraints will be considered.

This functionality will be tested and demonstrated by generating "dummy" players that make random motions, trigger random actions and chat with other players in the cube with "dummy" texts. Not only will the server be capable of handling such traffic but also when a real player gets into such a room, he/she will be able to see all the actions going on. This will be like a stress test for us and should not be taken for the AI component of the game.

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1 Cube. Natali, Vincenzo. Movie. http://www.imdb.com/title/tt0123755/

Artificial Intelligence Aspect

In all of the cubes, there will be several human players as well as one or two AI players. During the development of the game, several semantic clauses will be associated with each of the actions that can be performed on the objects inside the cube. Artificial Intelligence will be mainly implemented as a learning mechanism: i.e. AI can learn from the actions performed by the human players. As an example, if a human player has turned on the lights in some cube before, the AI player will be capable of suggesting to do so in later stages. Of course, depending on the semantics given to the actions, they will be able to reach more sophisticated conclusions. The main purpose of AI in the game is to introduce some clever suggestions that may guide the players in solving the puzzles. The AI players' suggestions will be based on their own experience, therefore, one cannot fully rely on them to solve every puzzle.

Possible Enhancements

Modular design is crucial in having a flexible implementation for future compatibility and customization. If possible, we are thinking of developing the game such that it allows a seamless upgrade functionality. In other words, developers at the server side will be able to install new modules without interfering with any of the players.

Depending on the results of the requirements analysis, an editor – where the developers are able to generate new cubes, place objects inside them, create an action list, add semantics to the actions and create the puzzle – can also be developed.

Of course, whether or not these enhancements can be implemented will be more clear on later stages of the project.