

CODESCHBEKE SOFTWARE SOLUTIONS

CENG 491

SENIOR PROJECT

PROPOSAL REPORT

FALL 2005

PROJECT TOPIC: 3D Educational Tool (EDU3D)
GROUP NAME: CodeSchbeke Software Solutions (C2S)
GROUP MEMBERS:

<i>Name</i>	<i>StudentID</i>	<i>e – mail</i>
Sıla ARSLAN	1347129	sila.arslan@gmail.com
Çağla OKUTAN	1347764	e1347764@ceng.metu.edu.tr
Hatice Kevser SÖNMEZ	1347905	hkevser@gmail.com
Bahar PAMUK	1347848	bahar.pamuk@gmail.com
Ebru DOĞAN	1297720	e129772@metu.edu.tr

Table 1 - Group Members

1 Roles & Responsibilities

Project leader provides the communication among the group members and coordinates the group activities. She is also responsible for the accomplishment of the separate tasks given to group members.

Meeting manager is responsible for the arrangement of the meeting dates and times. She presides over the meeting that is; she says the last word and makes the conclusion of the meeting. She is also responsible for following the deadlines.

Documentation and Configuration manager is responsible for taking minutes during the meeting and writing the taken decisions and things to be done until the next meeting on to the minute book. She is also responsible for management of versioning of the documentation.

Technical manager is responsible for the technical issues like the web site and its update also leads the implementation of the project.

Criticizer will help us to remind for the possible problems that may arise during the implementation due to a taken decision.

The roles and responsibilities are interchangeable among group members.

<i>Project Leader</i>	Sıla ARSLAN
<i>Meeting Manager</i>	Ebru DOĞAN
<i>Documentation&Configuration Manager</i>	Hatice Kevser SÖNMEZ
<i>Technical Manager</i>	Bahar PAMUK
<i>Criticizer</i>	Çağla OKUTAN

Table 2 - Roles & Responsibilities

2 Project Scope

Although the importance of traffic rules is very vital for human being, the education of people about this concept is insufficient in our country. Most of the accidents are originated from not obeying or not being aware of the importance of traffic rules. Generally people learn the traffic rules when they involve in the traffic and consequently this may cause some inevitable results. By this tool which attracts very large variety of people, it will be possible for them not only to test their knowledge about traffic rules but also practicing what have been learned or start learning from the very beginning.

In this project, we aim to develop an education tool which is intended to teach the traffic rules for the pedestrians and drivers, with 3D animation using computer graphics. The tool will be composed of basically two parts: the first part is an education guide for users to gain knowledge about general traffic rules and the second part is a game-like test in which the user's ability is graded according to the actions she takes in certain traffic cases. The tool presents different tests for pedestrians and drivers. The users will find the chance of learning traffic rules not from boring books but from much more entertaining and exciting computer program with the joy of 3D graphics where users will feel like finding themselves in the real situations. This tool may be used by the trainees in driver license courses and any of the people who are interested in learning traffic rules.

3 Research of Market

During our decision period on topic of the project, we had two ideas in mind as a topic. First one was teaching Turkish Sign Language(TID) to the literate people and the other one was teaching traffic rules to drivers and pedestrians. We made lots of researches on both. While searching the former one, we found out that the project would be limited with animation of TID letters and words. To go further in the project, we thought of animating TID sentences from a user-entered text but the grammar of TID is still a research topic. Since the project would turn to a natural language processing(NLP) project we concentrated on the latter one.

We found lots of studies about traffic and found demos of different products. There are tools most of which are about simulation that aim to teach driving and traffic rules. We affected by the ones having special and detailed environment and got in contact with their developers via e-mail asking for the information about their technology behind their work. After the feedback we took from that experts in the market[1] and interview with Veysi İşler[2], we decided to use a game engine to provide the same realistic effect. The game engines are used extensively in graphic

projects e.g. in game development and they empower the developers to be more flexible and creative. Up to now we considered to use Renderware Studio or 3D Studio Max. But our researches about their features are continuing. Below are the sites that we are inspired most:

- Traffic Demo by Newlands & Company, Inc. [3]

The company provides high-quality illustration, animation, photography, video and multimedia presentation services for architecture, transportation, and urban design. We get the information about their technology via e-mail and here is quote from the mail:

We do most of our work using 3D Studio Max (7.5). We have developed a number of custom scripts for generating traffic and managing cars using Max's scripting language MaxScript. We have also developed import routines in MaxScript to bring traffic data from traffic simulation software such as Vissim and Synchro. These applications allow traffic engineers to develop detailed models of traffic networks with signals and transit interactions and to run simulations in real-time. In Vissim, you can watch traffic jams develop on-screen in 2D or 3D and adjust the parameters to optimize the simulation. Vissim can export an ASCII file that lists the XYZ position of every vehicle in the simulation any time interval we choose. We import that to 3D Studio and run a physics simulation on each vehicle to get proper turning and then assign 3D vehicle models from our library.

Reproducing the traffic simulation in an animation package allows us to fix errors in the simulation and to employ much more sophisticated modeling, animation and rendering techniques than we could use in a real-time application.

Most recently, we have been using a global illumination renderer, VRay to improve the realism of our traffic animations and we have also begun to add animated 3D characters. The need for realism varies with the application.

A traffic simulation illustrating the operation of an intersection may not require a detailed context model or advanced rendering techniques, as the point is merely to show how the intersection works - not how it looks. However, most of the projects that we work on combine traffic and transit operations with urban design, so the visual quality of the simulation can be very important.

- StreetScenes by Center for Computational Research(CCR) [4]
StreetScenes is a software application developed at CCR that is designed to take the output of traditional traffic simulation packages and display it in an existing 3-D environment. This software package inspired us in visualizing the environment and angle of vision of the user.

Among all the demos of the software packages we examined so far, we did not encounter with any season and hour options. Also the type of the road was always the same that is, there are no dirt roads or unimproved road. We will give the opportunity to choose among these to teach how to behave in these conditions.

4 The Description of the Project

In doing this project our primary aim is not to make a tool for teaching how to drive, but to teach the traffic rules and how to behave in traffic for both pedestrians and drivers.

During the training phase, user will have the opportunity to choose any animation from any category of traffic rules by the help of a user friendly graphical user interface(GUI). The animations will show the applications of traffic rules by visualization and animation of different traffic cases such as the following example:

A car approaches a crossroads and stops for letting the car that has higher precedence to pass.

To mention about the test phase, the user will be allowed to travel in different roads either as a driver or a pedestrian. The game's purpose is to start from a place and reach to another, above a certain score which will decrease with each faulty action that is breaking of a traffic rule. We plan to have the following features:

- Training in different kinds of roads (e.g. asphalt, dirt road)
- Training in different seasons and different hours of the day
- Supporting different view of angles to the user(either inside or outside the car)
- Supporting the user to watch his overall activity at the end of a test

References

- [1] Donald Newlands
Newlands & Company, Inc.
tel: 503.287.8000 x510
fax: 503.493.3040
cel: 503.349.8203
tf: 866.442.NC3D
740 SW 21st Ave. Suite 330
Portland, OR 97205

- [2] Assoc.Prof.Dr. Veysi İşler
Office: B208
E-mail: isler@ceng.metu.edu.tr
Url:<http://www.ceng.metu.edu.tr/isler>
Phone:+90 312 210 5591
Fax:+90 312 210 1259
Address:Department of Computer Engineering
Middle East Technical University
Ankara, Turkey

- [3] Newlands & Company, Inc.
<http://www.nc3d.com/gallery/movies>

- [4] Center for Computational Research
<http://www.ccr.buffalo.edu/content/vizsample.htm>