Abstract

This project was designed with the intent of entering into the Seagate Multimedia Competition organized by the NUS Engineering Club for the Engineering Convention 1999. The Multimedia presentation should as far as possible, make use of 3 dimensional effects as well as sound and video clips. It should also last a minimum of 12 minutes. Our team had chosen to create a presentation illustrating the functional architecture of a handphone.

In the report, details would be given as to how the presentation was created with the use of several software in stages. Also, a brief discussion would be made on improvements that could be made to it as well as difficulties encountered during the making and design process.

Introduction

Our group had decided to use the following software to assist us in the making of the Multimedia presentation.

- Macromedia Director v.6.5
- 3-D Studio Max R2
- PowerPoint 97

Macromedia Director was the main platform from which one would be able to adjust the timing of different scenes of the presentation so that it would be smooth flowing. This software allowed the various imported scenes to run simultaneously as this program was capable of combining all the slides into a movie.

As for 3-D effects, the program 3-D Studio Max which was excellent for creating and animating three-dimensional objects was used. These images were saved and imported into Macromedia Director upon completion.

PowerPoint was used mainly for displaying text and information to be conveyed to the reader. Each slide comprised of a heading and was kept as brief as possible so as not to bore the viewer. Every slide created by PowerPoint was saved separately and imported into Macromedia Director to combine with the other sound and graphics animations.

A couple of video clips was also included at the beginning and end of the movie that were found to be relevant to the theme. Sound effects in the form of .wav files were also included. The viewer would be enticed into space and at the same time be introduced to the basic functional architecture of a handphone in the process.

Procedure

POWERPOINT

The use of this program was mainly to display relevant information that our group wished to convey to the viewer with regards to the functional architecture of the handphone. The slides were arranged in the following manner:

- Introduction

This introduces certain definitions and novel features brought upon by the cellular network principle.

- Overview of a Handphone

It comprises of two main parts, mainly the terminal handset and the Subscriber Identity Module.

- Functional Architecture of the Mobile Terminal

It consists of five modules, namely, the radio, processor, synthesizer, control and the user-interface sub-modules.

- Mobile Terminal Structure

It consists of tangibles such as keyboard, display, microphone and earpiece.

- Subscriber Identity Module

It operates in conjunction with the memory card and is used in user authentication, radio transmission security and storage of subscriber data.

- Passive Subscriber Authentication Technique

In this technique, the PIN entered on keypad by A is compared with that on the SIM card. If authenticated, A will be recognized as an authorized user.

- Active Subscriber Authentication Technique

In this technique, now whenever A presents itself for authentication, the SIM card makes a different request each time so that impersonation will be made difficult.

- Module Lifecycle

It is the period of time separating the manufacture of the chip and the withdrawal of the SIM from service. The GSM (Global System for Mobile Communication) and the ADM (Administrative Management) defines the module lifecycle.

In order to liven up the slides, several nice handphone graphics were chosen and incorporated. Different backgrounds were also chosen for each of the slides.

In order to avoid the viewers from reading entirely from the PowerPoint slides and also to make our slides too lengthy, the presentation was designed to make it more like an interactive tutorial style of presentation by having a voice to introduce the important points and elaborate on them.

A text-to-speech converter program was employed to help fulfil this purpose. By logging on to the website URL http://www.bell-labs.com/project/tts/voices.html, one would be able to type in the text which the user wanted to convey to the viewer and the program would automatically convert it into a .wav file which could then be imported into the Macromedia Director.

USAGE OF MACROMEDIA DIRECTOR 6.5

Macromedia Director is a software which allows users to create movies of their own. Thus, for our Multimedia presentation, in order to produce a movie-like presentation with sounds and animated graphics, Macromedia Director was used.

At this stage, which was the final stage, everything that was done in the earlier stages such as the sound files, 3D animations and text, would then be imported into the Macromedia software.

There were altogether 14 slides of which 12 slides were based on our presentation topic, the mobile phone. An environment that would give the viewer a feeling of being in space was found to be suitable for this topic, and thus a black background with stars was chosen to be the first slide. For the subsequent slides, 3D animated files from Studio Max were imported in just before a new sub-topic. These files included moving spheres which would be 'flying' from one point to another. This was to indicate the change of sub-topic as well as the transition from one part of the mobile phone to another. Lastly, PowerPoint presentation slides were imported in, after the whole presentation was broken up into its various sub-topics.

Many problems were faced while creating this movie. One of the most significant problems was the timing. It had to be very precise and there should not be many time lags in between each slide. Every single sound file was placed in order at the same time space with the corresponding graphics or text. This took up a lot of time. For example, the length of time period one slide had to stay present had to be adjusted depending on the amount of time the corresponding sound file (presenter's speech) would take.

Secondly, the PowerPoint presentation file could not be imported into the Macromedia Director initially. This was because it did not recognize the type of the file it was saved as. It was only found out later that all the PowerPoint

presentation slides must be saved as PowerPoint 4.0 (older version) so that they could be imported in. The whole PowerPoint presentation was split up into various individual files, each containing one slide instead of just one single file. This would make things easier when doing the importing job. After the PowerPoint slide was imported in, it would come with many files such as object files (for background), text files (one heading would mean one text file). Much time was needed to identify which was which. As some text would be appearing much later compared to others, the time that that particular text would appear would need to be adjusted accordingly by moving the time bar. Also, due to some unforeseen problems, the whole PowerPoint slide was in disarray after being imported in as the text and graphics were aligned out of place.

Thirdly, sound files were needed to be adjusted according to the time taken for the presenter to finish speaking. In fact, these sound files needed to be played many times so as to catch the exact time spot where the presenter had finished elaborating on one point and just before he went on to the next point. In this way, the next text file could then be placed at that particular time spot so that it would appear promptly during the presentation. This proved to be very taxing especially if the particular PowerPoint slide consisted of a flowchart.

The whole movie needed a lot of fine-tuning before it was finally converted into a projector format and used as an application file.

USAGE OF 3D STUDIO MAX

To produce 3D animations for the Multimedia presentation, a program known as 3D Studio Max was used. This program allowed the user to render 3 dimensional objects in space and perform operations such as rotation and scaling of the objects' position with respect to time. The user was also able to change the axis and direction of rotation. There were also functions to change the viewing angle as well as to enhance the perception of depth by changing the camera angle and by adding lighting effects to the entire scene. All the operations in 3D Studio Max were time-based. There was a time bar that could be adjusted to increase or decrease the total running time of the animated clip. The animation could be set to run at specific timings using the time bar.

The Multimedia presentation was based on the handphone and mobile telecommunications. The process by which a call was transmitted via the handset to the main system and finally received by the other party was represented by spheres in the virtual world animation. Each sphere represented a module or system which the signal had to go through during the entire process. Each module had one or more sub-systems, and these were represented by smaller spheres orbiting around the main module.

All objects that were to be included in the animation had to be drawn first at their relative positions. The flow of the presentation was such that we would be moving to a particular module concerned first before elaborating on the module in greater detail. As such, movements in the virtual world had to be broken up into many short clips.

Movement from one module to another was done as such. The time duration of the short clip was first set. Since the spheres were supposed to be rotating at all times, the time bar was set to the maximum time, and at that time position, the sphere was then rotated several times around its own axis and the animation

recorded. The program would take the number of rotations and the time on the time bar that the animation had occurred to calculate the speed of rotation of the sphere such that when the time bar moved from zero to the set point in time, the sphere would have rotated by the amount set. For example, the position of the time rule was set at 100 seconds and the sphere was rotated 10 times at time equal to 100 seconds, which was recorded. When the time bar was brought back to 0 seconds and the animation played, the sphere would be rotating at a speed such that as the time moved from 0 to 100 seconds, the sphere would have rotated 10 times when it reached the 100 second mark. Once all the individual object animations were set, the objects at their various positions were then grouped together as one object. This was done so that when moving through the virtual world, the perspective of all the objects in the world would change at the same time and rate. For the first scene, it was adjusted so that the first object appeared a small distance from the viewer and as the clip played on, the viewer would gradually move closer to the object until the object took up a larger part of the screen. For subsequent objects, the first scene would be the last scene of the previous clip.

A path was then planned and various positions as well as their timings were recorded to give the viewer the perception of movement from one object to another. A few turnings were added to the movement so that it would not seem too straight and monotonous. After all the main animations were done, a few background objects were added so that the scene would not appear too dull.

A point to note was that the entire scene could not be grouped first, before recording the individual animations. This was because once all the objects were grouped together, they would be sharing a common axis. As such, the user could only animate the entire object as a whole and would not be able rotate individual objects. Should the user ungroup the entire scene to animate individual objects, all animations done on the scene as a group would be lost.

CONVERTING .GIF FILES INTO BITMAP IMAGES

The animation graphics that was obtained from the Web were in the form of .gif file. However, we were using Macromedia Director 6.5, which could not import in .gif files, so there was a need to convert the .gif files that we had into ordinary bitmap images.

To convert the .gif file, first let the animation be displayed on the desktop, and the first movement of the animation was captured by pressing the keys ”ALT” and “PRINT SCREEN” together on the keyboard. Next, a new file was opened in the Microsoft Paint, and the image that was captured was then pasted. In the Microsoft Paint, the size and the colour of the image could be altered. After all the necessary changes had been made, the file in the bitmap image format would be saved. These steps were repeated till all the possible movements were captured. All these individual bitmap images were arranged in sequence before being imported into the Macromedia Director. In the Macromedia Director, we could fix the duration for these images to be displayed. In this way, these images would be displayed one after the other within the duration resulting in an animation effect.

CREATING ANIMATIONS

A picture of the hand phone was obtained from the Web and the above method was used to save the picture into bitmap image format. The picture was split into half, which were placed at some distance apart. The new picture was then saved into bitmap image format. The above steps would be repeated with varying distances. These individual bitmap images were arranged in sequence of increasing distance before importing them into the Macromedia Director. In the Macromedia Director, the duration for these images to be displayed could be fixed. In this way, these images would display one after the other within this duration resulting in an animation effect.

SOUND AND VIDEO CLIPS

In order to let the audience have a better sensational effect, our group decided to have some special sound effects as the background for the entire 13 minutes presentation. Most sound effects that we could obtain from the web are in the form of .wav, MP3 or .mid files. However, the software that was employed, Macromedia Director, could only allow .wav files to be imported. Therefore, a few .wav files was imported into the Macromedia Director.

Besides the sound effects, our group also decided to include two video clips into our presentation, one would be at the beginning and the other would be at the end of the presentation. To do that, we downloaded several video clips from the Web, ranging from 2 MB to 4MB of space. Our group had decided a theme for the entire presentation, which was “space”. Therefore, two video clips that were related to our theme were selected.

Discussion

In the process of creating the Multimedia presentation, our group had encountered several difficulties initially at trying to synchronize the timings such that one scene follows the other. If the timing was not done properly, then it was realized that certain scenes would be truncated or there would be too many time lags in between scenes and this lapse might irritate the viewer.

Hence, it was necessary to time how long it would need for a particular scene to play completely and gave a leeway of one second to prevent truncation and hence allowed the presentation to be a fluid one.

In addition, in importing sound files into the Macromedia Director, it was realized that it did not support midi files and hence all our sound files had to be in .wav format. Therefore, it was unable to put in files to provide background music. Instead, we used several .wav files and inserted them at appropriate scenes to produce the desired effects.

The animations made in the PowerPoint were unable to be registered by the Macromedia Director after importing and all the timings had to be done in the Macromedia Program again which were rather inconvenient and time-consuming.

Certain improvements could be made to our presentation. Firstly, instead of using the text-to-speech converter, Our voices could be recorded instead by using a microphone and a sound recorder and convert it into .wav files. The reason for this was that the range of voices in the text-to-speech converter was very few and monotonous.

Secondly, the number of slides could be reduced and in their place more video clips and animations created by Studio Max could be put up but were not being able to do so due to the time constraint.

Conclusion

In this Multimedia Presentation project, my group had successfully come up with a 12-minute presentation coupled with 3-D effects, video clips, sound and animations as required. We had hoped that by the end of the presentation, our viewers would have a greater understanding and insight with regards to the internal architecture of a mobile handphone.

As this was our first attempt in making a presentation and learning to use the relevant software, we were unable to come up with a complex and a highly visual entertaining presentation.

This project had given us great insight on how a presentation was made and with this knowledge, we would be able to embark on more sophisticated and intriguing presentations in future.

References

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