GATE 724
Term Project

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Sound over Game Video

Music and Sound Production for Games

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Contents

INTRODUCTION

GATE 724 is a course offered by Game Technologies Master Program in METU Informatics Institute. The instructor, Dr. Tolga TEM, being a composer and educator, teaches “Music and Sound Production” especially for video games. During the course, awareness and knowledge about Music and Music Technology is gained. The students taking the course are not expected to have a prerequisite knowledge in music. Just with the interests in music, this course can help you to improve your perception and interpretation about any kind of sound or music. The covered subjects include music and sound definitions, instruments and their usages with computer and so in video games as a support tool for visual.

PROJECT SCOPE

After gaining the knowledge about music and sound concepts, the students are expect to reflect their improvements during the course. Our perceptions of music and sound are observed by a sound effect and music implementation over a silent 2’23’’ long video games series. This series includes 3 different video games, namely XCOM: Enemy Unknown, Far Cry 3 and The Walking Dead. The cut scenes are chosen and prepared by the instructor. We are let free about the preferences of sound effects and background music. In fact, this project reflects our sensation and perception about what is good and convenient for the visual we have seen.

PRODUCTION

Methodology

As the first step of the production, the analyzation of the video and the software that we will use takes place. After watching the silent video, the sounds that I want to hear play into my mind for specific main scenes. The software has introduced by the instructor and the main functionalities that we possibly will need is pointed out. Other steps are as follows:

1. Not to watch/listen the videos with real sound over versions.
2. Having a look at music and sound features definitions.
3. Mapping some of the features with some prominent scenes in the video that the usage is inevitable like sound bridge or panning.
4. Collecting sound effect data sources like free and qualified sound effect web sites or library collection like BBC’s sound effect library.
5. Placing the video in the software and getting used to its usage and functionalities with the sound effect manipulations.
6. Picking the compatible sound effects and background music for each video.
7. If it distracts the fluency of the video, re-choosing sound effect, if necessary, editing the sound by software.
8. Listening continuously what is placed in the timeline. This ensures the coherence of the result.
9. Revising the result with the instructor, utilizing the feedbacks.
10. Analyzing the overall result yourself, last revisions.

Tools and Programs

For organizing and editing sound effects, the software programs are Sony Vegas Pro (12) and Sony Sound Forge Pro (10). In Vegas, I add the sound effects over the main video in the timeline, whenever I need to change a sound effect in physical structure, the linked sound editor program for Vegas, which in our case is Sound Forge, is used.

Searching for Sounds

While searching the sound effects, web sites that serve qualified sound effects which are generally in wav. format and have high bit rate. If the sound effects were not free, I record the sounds through internal stereo mix jack with 2 channels, 24 bit, 44100 Hz in studio quality. In addition, the purity of the sounds is taken into consideration. Especially when some background sounds or supporting bass sounds are present, the main and front sound effect is diminished in terms of influence. So, these kinds of sound effects have been avoided. Because each video game should have its integrity in terms of sound, compatible sound effects in terms of texture are tried to be found. For example, in the first video, XCOM: Enemy Unknown, the spacecraft door lifter opening is different from the regular vehicle door openings. Furthermore, the gun shots should be compatible with the space concept, so laser kind of texture is needed for supporting the concept and enabling the integrity.

For background music for all of three video games, I used the same film series soundtrack music, the Matrix. Because I think that this project is expected to reflect one's perspective, which is mine, so I used one movie's original soundtracks perspective that I love, for all three video games.

Processing Sounds

Here the list of some definitions used throughout analyzing the project implementation:

- **Melody:** Succession of musical tones that the listener perceives as a single entity.
- **Pitch:** Ordering of sounds on a frequency related scale. Higher/Lower in the sense associated with musical melodies. (in TR : Sesin tizliği-baslığı)
- **Rhythm :** It's concepts are tempo and meter.
- **Dynamics :** It is related to changes in volume.
- **Timbre :** It is the colors which the harmonics makes the instruments sounds different.
- **Texture and Form :** It's the structures in musical composition.

Nature in Music

- **Scales :** The system of series of notes, which are arranged in an order.
- **Tonality :** The system of the scales which are related to each other in a specific order around a key note.(major-minor)
- **Harmony :** It's a beautiful combination of multiple notes.

Type of Sounds

- **Natural Sound:** Sounds which directly connected to the source.(car horn)
- **Unnatural Sound :** Sounds which are not directly connected to a source.(bouncing ball)
    - A sound can be both natural and unnatural.(howling wolf - loneliness)

Effects of Sound Usage

- **Sense of Reality**
- **Visual Perception and Ability to Visualize**
- **Support Concept**

Roles of Sound

- **Realistic Usage**
- **Dramatic Impact**
- **Background Support**

Relations with Visual

- **Diegetic sounds:** Any sound presented as originated from source within the media's(like film) world. (can be either on screen or off screen depending on whatever its source is within the frame or outside the frame)
- **Non-diegetic sounds:** Sounds whose source is neither visible on the screen nor has been implied to be present in the action. It is represented as coming from a source outside story space.(character can't hear)
- **Synchronization:** The combination of sound with its source.
- **De-Synchronization :** The separation of sound and visual.(character visualize and we just hear)
- **Sound Bridge:** The sound that continues while changing to another plan, or sometimes hearing the new sound which is heard before the new scene uppers.

Value of Sound for Visual

- **Delivering and adding information easier**
- **Delivering the feeling of the moment easier**
- **Creating the Rhythmic structure**

Here is the list of the usages of these concepts in the project practice of totally ***3 video and 142 audio tracks***:

#0 INTRO

Sound Feature	Explanation	Ocurrence Time
Rhythm, Creating the Rhythmic structure	The appearances of the visuals are adapted to the tempo of the background music.	00:00-00:20
Sound Bridge	While the scene is changing, the music continues.	00:20-00:25

#1 XCOM: Enemy Unknown

Sound Feature	Explanation	Ocurrence Time
Background Support, Dramatic Impact	To correlate with the game environment which is a futuristic battle field, soundtrack music from Matrix which is used in fight training scene is used.	00:20-01:10
Natural Sound, Synchronization, Dynamics, Panning, Pitch	The sound is coming from the spacecraft, so it is natural and synchronized sound. It appears from left to right so panning is used. To reflect the rotating and going away movement volume is changed and different sounds in terms of frequency are used for overall effect.	00:23-00:31
Natural Sound, Synchronization, Diegetic, Rhythm	The rhythmic soldier marching sound is originated from soldiers and the footstep movements are synchronized with the sound.	00:31-00:33
Natural Sound, Synchronization, Rhythm, Dynamics	The rhythmic alarm sound is originated from alarm itself. Because the scene is slowing down, the volume is lowered quickly.	00:31-00:33
Rhythm, Pitch, Delivering the feeling of the moment easier	The visual effect is supported by the sound.	00:34-00:36
Background Support, Support Concept, Realistic, Diegetic, Dynamics	To support the mood of war, battlefield sound is used. The volume of it is changed time to time.	00:35-01:09
Natural Sound, Synchronization, Panning	The spacecraft is coming from right to left.	00:36-00:38
Natural Sound, Synchronization, Harmony	To reflect the spacecraft door opening, a hydraulic lifter, opening door and heavily hitting the ground effects are combined.	00:38-00:39
Natural Sound, Synchronization, Diegetic	One laser gun shot is duplicated.	00:41-00:42
Natural Sound, Synchronization, Diegetic	The footsteps of the soldier.	00:41-00:43
Natural Sound, Synchronization, Diegetic, Harmony	The soldier slipping and hitting to the car effect is gained with two sound effects, sliding and scratching.	00:43-00:44

Natural Sound, Synchronization, Diegetic	For lifting machine gun head, a metal can scratching sound is used.	00:44-00:44
Natural Sound, Synchronization, Diegetic, Harmony, Pitch	To reflect overall machine gun fire, two sounds with low and high pitches are combined.	00:45 – 00:46
Natural Sound, Synchronization, Diegetic, Dynamics	To reflect the preparation of the robot soldier for fire, some kind of alien stretch sounds are used one after another. The movement is seen from far away first, so initial volume is low.	00:49-00:51
Natural Sound, Synchronization, Diegetic,Scale	There are 3 explosions. The second one is the time stretched version of the first one.	00:55-00:59
Natural Sound, Synchronization, Diegetic, Dynamics	The lifting sound of the soldier in the air is decreasing at first, then increase. Because he is flying up and away from us at first.	00:59-01:01
Natural Sound, Synchronization, Diegetic, Pitch, Harmony	In the shotting scene, two different sound effects with different pitches are used.	01:07-01:08

#2 Far Cry 3

Sound Feature	Explanation	Ocurrence Time
Background Support, Dramatic Impact	To correlate with the action-adventure game environment, soundtrack music from Matrix having more tempo is used.	01:10-02:06
Natural Sound, Synchronization, Diegetic, Dynamics, Pitch, Harmony	To gain the overall sea and waterfall effect 3 different sound effects are combined with different pitches and volumes.	01:10-01:12
Natural Sound, Synchronization, Diegetic, Dynamics, Pitch, Harmony	To gain the overall falling in the air effect, wind and parachute sounds are combined.	01:13-01:15
Natural Sound, Synchronization, Diegetic, Dynamics, Panning	At the nature scene, at first the birds are far away, but in the next scene they are close so the volume is increased. Their movements are at the left side so panning is used too.	01:21-01:26
Natural Sound,	The two types of soldier	01:26-01:27

Synchronization, Diegetic, Dynamics, Pitch, Texture, Harmony	running footsteps are used. One is running on water sound, the other is on grass. They are combined.	
Natural Sound, Synchronization, Diegetic, Dynamics, Pitch, Scale, Harmony	To gain overall bats crowd effect, 4 sound effects are used. 3 of them is version of one. Some of these three is reversed, some of shifted. This combination created the effect.	01:33-01:33
Natural Sound, Synchronization, Diegetic	Man screaming on the ground before being hit.	01:35-01:35
Natural Sound, Synchronization, Diegetic	At first reversing the explosion sound created a fire extinguisher sound effect, but then I improved it.	01:35-01:36
Natural Sound, Synchronization, Diegetic	Because I perceived the viewer perspective as a camera in the battle field, event fx is added to the man speech so that the sound is coming from the camera device.	01:46-01:53
Background Support, Support Concept, Realistic, Diegetic	To support the mood of fire field, gunshot effects are used.	01:46-01:52
Natural Sound, Synchronization, Diegetic, Pitch	Because the men are in the chopper, the begging man sound has low pitch which is suppressed by the chopper sound.	01:54-01:55
Natural Sound, Synchronization, Diegetic	For the woman voice reverb evet fx added. Because the mood of the woman and the slowing down visual at the background were suitable for this effect.	01:57-01:59
Natural Sound, Synchronization, Diegetic, Dynamics, Pitch, Texture, Harmony	To gain the overall blast effect, 3 different sound effects with different event fx are combined. Reverb and chorus effects are used.	02:02-02:06

#3 The Walking Dead

Sound Feature	Explanation	Ocurrence Time
Background Support, Dramatic Impact		02:06-02:47
Natural Sound, Synchronization, Diegetic,	All the different car breaks, crashing and human	02:06-02:12

Dynamics, Pitch, Texture, Harmony	screaming voices were combined to get the overall effect.	
Natural Sound, Synchronization, Diegetic, Support Concept	The meaning of the talk of the man was chosen to correlate with the concept of the game.	02:13-02:15
Natural Sound, Synchronization, Diegetic, Pitch, Texture, Harmony	Grabbing axe sound was gained by combining toolbox placing and sword placing sound.	02:15-02:16
Natural Sound, Synchronization, Diegetic, Dynamics, Pitch, Harmony, Panning	The sound of attacking is gained with two different sound effects because the camera angle is changing, so little silence has been added and panning is used.	02:16-02:17
Natural Sound, Synchronization, Diegetic, Support Concept	The meaning of the talk of the man was chosen to correlate with the concept of the game.	02:18 – 02:20
Natural Sound, Synchronization, Diegetic, Dynamics, Pitch, Harmony, Support Concept	The roaring sounds of zombies are gained by 6 different sound effects. Some volume changes and event fx like chorus and reverb are used to reflect the crowd and reflection feelings.	02:21-02:24
Natural Sound, Synchronization, Diegetic, Dynamics, Pitch, Harmony, Support Concept, Background Support	While being shot some zombie roaring sounds added for background support with low volume.	02:24-02:25
Natural Sound, Synchronization, Diegetic, Pitch	The place of talk is some kind of kitchen with furnished with metal objects, to gain the reflection effect chorus and equalization event fx's are added.	02:25-02:26
Natural Sound, Synchronization, Diegetic, Dynamics, Pitch, Panning, Support Concept	A little attacking attempt of one zombie with voice is added. The movement is from left to right so panning is used.	02:26-02:28
Dynamics, Dramatic Usage, Creating the Rhythmic structure	To support the title appearance visual effect, the background music volume is increased instantly.	02:27-02:28
Dynamics, Dramatic Usage, Creating the Rhythmic structure	To support the title appearance visual effect, the background music volume is decreased beforehand and increased instantly.	02:30-02:31
Natural Sound ,Non-Diegetic,	While the title of the game is	02:40-02:44

Support Concept, Background Support	shown, a zombie speech is used to support the concept. The reverb event fx is used.	

#4 FINAL

Sound Feature	Explanation	Ocurrence Time
Sound Bridge	While the scene is changing, the music continues.	02:43-02:48

Finalization

At the finalization part, whole video is watched and listened. Especially background music – sound effect modulation is observed. Human voice parts revised so that they can be hear clearly and distinctly. Because all the individual sound effects have been chosen carefully, I have not changed anything about them. However, some moving away or to scenes are realized. So the sound volumes are changed for some parts. Opening and closing parts were added at the beginning and end of the video.

CONCLUSION

Through the entire project implementation process I mainly learned the meaning of coherence and harmony of the sounds in between and over with a visual. While forming this integrity, the importance of some music&sound concepts are realized like timing, synchronization, sound bridge. Moreover, some features of the tools are experienced like equalization&reverb&vibrato effects, fade in/out, volume&pan, time stretching, and looping. By practicing these concepts with this project, their impact on learning process has been made permanent. Working approximately 6 full days on this project, the concentration on the mood of the sounds over videos didn't change. Also I realized that these kinds of projects are not suitable for giving breaks while working on. Because your mood and style can change time to time, so the coherence can be broken.

Formerly I just hear the sounds. But now, with the technical knowledge and aesthetic perception gained, I listen the sounds. Now, I can feel the mood of the music and express my feelings through the music in terms of words and sound itself. So I believe in myself that, the aim of the course, the awareness in music and sound is gained.

SOURCES&REFERENCES

I used different free sound effect provider web sites or record sounds from there.

For **sound effects**:

- http://www.pond5.com/sound-effects/1/*.html
- http://soundbible.com
- http://www.freesfx.co.uk/sfx/
- http://www.premiumbeat.com/sfx

For **voice sounds**:

- http://www.freesound.org
- http://www.soundsnap.com
- http://www.hark.com/search

The content of the speech are chosen to support the related concepts of the games and scenes.

For **background sounds:**

- “Clubbed to Death” by Rob Dougan[Kurayamino Mix] – The Matrix OST – XCOM: Enemy Unknown
- “Spybreak!” by Propellerheads – The Matrix OST – Far Cry 3 Video
- “Mona Lisa Overdrive” by Don Davis and Juno Reactor – The Matrix Reloaded OST – The Walking Dead Video