1. Introduction

This introduction situates and explains the problem this thesis deals with. Next to that, the previous work, problem and organisation of report are mentioned.

Introduction

1.1. Situating the need for conversion

Audio makes live enjoyable for a lot of people. As they want to listen to their favorite music at almost every place, thinkable or unthinkable, there is a need for continuously offering new applications. The trend is to offer as much as possible in as small space as possible, and that is why compression is often needed.

In this search for new and better compression methods, MPEG can be situated. It is meant to offer a high compression for high quality together with the advantage of being standardized. The previous phases of this standard have already offered a lot of useful applications, for example: MP3, DCC, … . As new applications will probably be based on the newest standard, it has to be investigated first. And this investigation of the standard is also worthwhile considering for the companies not related to the development of the standard, because in this way they can also produce MPEG compliant applications.

This standard is based on Digital Signal Processing (DSP) and more specifically on the compression of digitally represented data. For this reason it can be used on a PC-platform or any platform based on a processor.

1.2. The problem

The problem to deal with, consisted of several parts, summed below:

- Searching and understanding the history of MPEG. This contains the parts video, audio and systems of the previous standards.
- Then, the MPEG-4 AAC coder had to be investigated until the basics were understood.
- Choosing one particular tool out of the encoder and taking care so that all the floating-point calculations were replaced by fixed-point calculations.

1.3. Assignment

The parts this assignment consists of, are nearly the same as the ones summed under: "The problem.". The only extra task to fulfil was the programming of testbenches. These were meant to check if the adaptations, done in the last step, were achieved in the right way.

1.4. Objectives

The main objective of this thesis was to investigate and adapt a part of the MPEG-4 Low Complexity Advanced Audio Coder. This was done by using the reference code, that is a part of the standard, and the standard itself.

1.5. Organisation of the report

In the second chapter, a short introduction to the need and use of digital audio presentation is provided. Starting from the digital presentation, some compression forms, used for audio, are described as well.

In the third chapter, the acronym MPEG is explained. This includes a description of the MPEG working group, the structure of the standard, history of the phases and future perspectives.

In the next chapter, an introduction to MPEG-4 audio in general and a description of the tools, contained in the MPEG-4 AAC encoder, is provided.

The explanation about the testbenches that were constructed and their use is given in the last but one chapter. This part also contains a description of why and how these testbenches were constructed and how they should be used.

Last but not least, a description about the changements from floating-point to fixed-point arithmetic is provided in chapter 6. It does not contain an in detail description, though the parts necessary for understanding the way things were handled, are provided.

In the separate appendix, the code for the testbenches and the changed tool can be found.