Research document

Audio digital signal processor

BeCreative Minor

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Contents

List of Figures

List of Tables

Chapter 1: Introduction

The project audio-DSP raises the main question: **"How to design an audio-DSP?"**. From the main research question the following sub-research questions are derived:

- What is the best method for creating digital filters?
- What is the best method for creating digital effects?
- What is the most suitable anti-aliasing filter?
- What is the optimal needed roll-off for the anti-aliasing filter for a given bandwidth such that the noise can be negligible?
- What is the minimum sample frequency needed to capture the desired frequency spectrum?
- What is the minimum frequency range to be sampled to achieve sufficient detailed audio?
- What is the lowest allowable noise for decent audio?
- What ADC resolution is needed such that the quantization error and noise level are on par?
- What ADC and DAC architecture is most suitable for this application?
- What kind of processor is most suitable for this application?
- What is the permittable jitter for accurate audio?
- What is the maximum allowable ripple on the reference voltage for the ADC and DAC?
- How much RAM does the system need?
- How much flash does the system need?
- What power supply topology is best suited for each part of the system?

In the following chapter the sub-research questions will be researched and documented.

Chapter 2: Research questions

2.1 Best method for creating digital filters

2.2 Best method for creating digital effects

2.3 Most suitable anti-aliasing filter

2.4

Appendix A: Appendix A