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SIGNAL PROCESSING

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Abstract--Signal processing applications usually encounter multi-dimensional real-time performance requirements and restrictions on resources, which makes software implementation complex. Although major advances are made in embedded processor technology for this application domain — especially , in technology for programmable digital signal processors — traditional compiler techniques applied to such platforms don't generate machine language of desired quality. As a result, low-level, human-driven fine-tuning of software implementations is required , and that we are therefore in need of simpler strategies for software implementation for signal processing applications. In this thesis, variety of important memory and performance optimization problems are addressed for translating high-level representations of signal processing applications into embedded software implementations. This investigation centres on signal processing-oriented dataflow models of computation. This form of dataflow provides a coarse grained modelling approach that is well-suited to the signal processing domain and is increasingly supported by commercial and research-oriented tools for design and implementation of signal processing systems. Well-developed dataflow models of signal processing systems expose high-level application structure which will be employed by designers and style tools to guide optimization of hardware and software implementations. This thesis advances the suite of techniques available for optimization of software implementations that are derived from the appliance structure exposed from dataflow representations. In addition, the specialized architecture of programmable digital signal processors is taken into account jointly with dataflow-based analysis to streamline the optimization process for this important family of embedded processors. The specialized features of programmable digital signal processors that are addressed during this thesis include parallel memory banks to facilitate data parallelism, and signal-processing-oriented addressing modes and address register management capabilities. The problems addressed during this thesis involve several inter-related features, and thus an integrated approach is required to unravel them effectively. This thesis proposes such an integrated approach, and develops the approach through formal problem formulations, in-depth theoretical analysis, and extensive experimentation.

Keywords----Frame,Window,Slice,Hop,Audio signal processing ,Stream.

1. Introduction

Signal processing is used for electronic signal processing. In which transducer converts one form of energy into another form of energy. Here it converts physical energy into to electric current waveform .It is then processed and transmitted as electromagnetic waves.the signal

processing technique used is fourier transform which contains well defined frequency materials.Alan V.Oppenheim and Ronald developed the numerical technique in the 17th century.

Signal processing charge the analysis ,modification of signals,which are classified by their attributes of some event such as sound,images and biological measurements.It is used to improve the signal transmission fidelity.

A.Signal procession techniques

Signal processing involes techniques that improve our understanding of information contained in a received ultrasonic data.For many signals this is the most logical and intuutuve way to view them.simple signal processing often involes the use of gates to isolate the signal of frequency to smooth unwanted frequencies.It is more useful toview a signal by broad bandwidth ,transducer and frequency.fourier signal the waveform can be of amplitudes,phases,frequencies,which makes the complex waveform in the result.

II.CHAPTER

There are two types of signal processing they are

- ✓ Analog signal
- ✓ Digital signal

Digital signal processing:

It is the use of digital processing,such as by computers,to perform a wide vareityof signal processing operations.the signal processed in this manner are a sequence of numbers that represents sample of a continous variable in a domain such as time,space,or frequency.
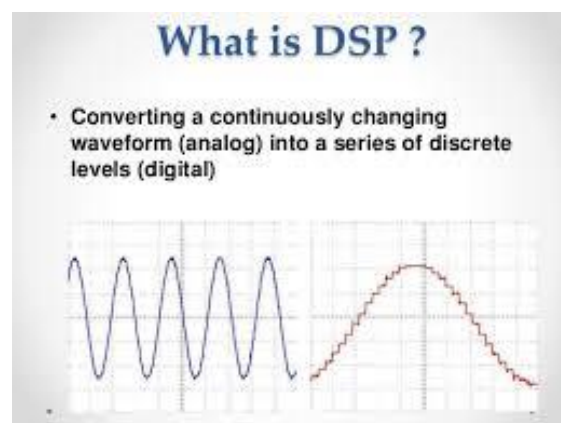
It contains audio,speech processing,sonar,rador,and other sensory array,for telecommunication control system amist others.it also includes linear and non linear operations in it.

- ➢ Applications:
  - • Audio signal processing
  - • Digital image processing
  - • Digital communication
  - • Rador
  - • Sonar
  - • Financial signal processing
  - • Seismology
  - • Biomedicine

Some examples are transmission in mobile phones,hi-fi,weather forecasting analysis and

control of audio effects,graphics,cat scans,mri,mp3 and so on for the use with electric guitar amplifier.

III.CHAPTER

A.Advantages of digital signal processing

- High accuracy.

When the analog waves get affected by the tolernze.It has superior control over the accuracy.

- Cheaper

This is much cheaper than the analog signal processing.

- Flexibility

Dsp can be easily changed or reconfigured only by changing theprogram.but it is difficult in analog .

- Ease of data storage

By a magnetic media with loss of fidielity the digital signals can be processed and can bestored in a remote laboratory.

- Time sharing.

The cost of processing is reduced by digital signal processing

Analog Signal
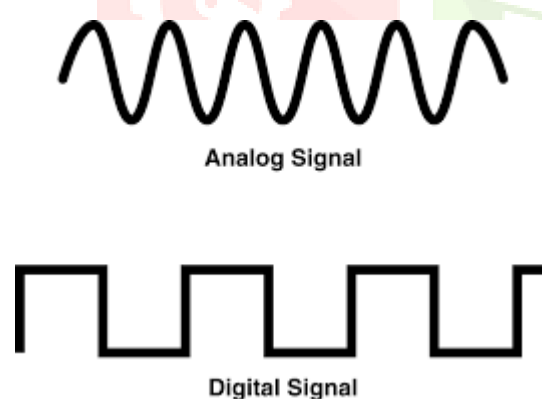
Digital Signal

IV. Limitations of signal processing

- System complexity

The reconstruction will contribute system for complexity.this is due to the use of digital to analog ,analog digital convertors which causes the system complexity.

- Power consumption

It uses high power consumption since it consists of over four lakh transistors.

A.Applications of digital signal processing

- Telecommunications.
- Consumer electronics
- Image processing
- Instrumentation and control
- Medicine
- Seismology
- Military application

B.Analog digital signal processing

Analog is any type of signal processing conduct on continous analog signal bys some analog signals.it is mathematically represented as a set of continous values.they are commonly represented as voltage,electric current around the components in the electric device.
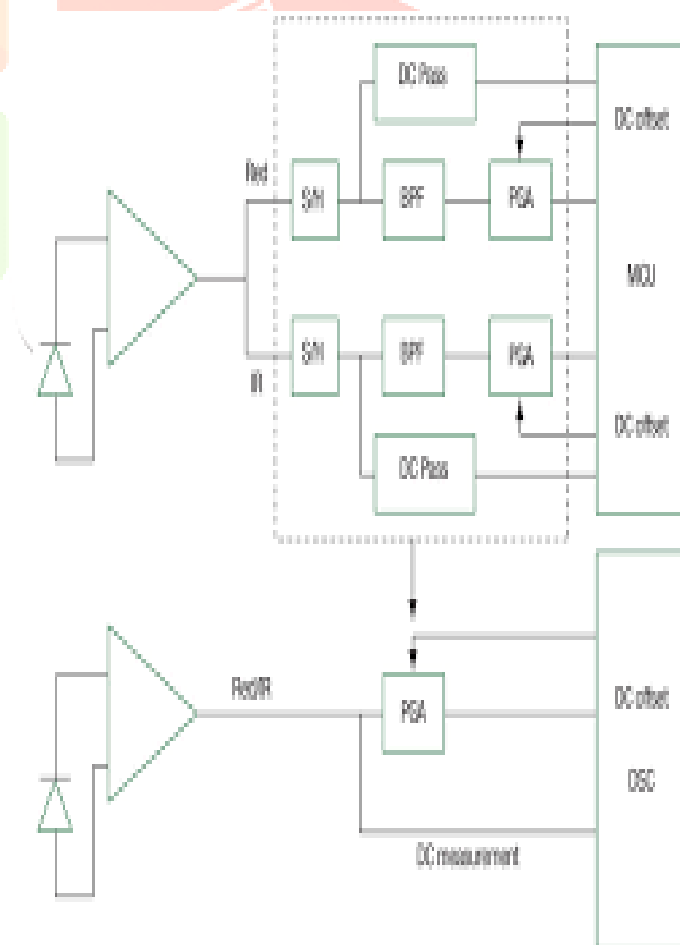
Some example of analog digital signal processing are bass,treble,volume control on steros and tint controls on tv which also include elements like resistor,inductors and transistors.

C.Advantages of analog signal processing

- Analog- there is no quantization error.
- Less bandwidth
- Low cost
- Easily constructed
- Less consumptionof time

D.Disadvantages of analog signal processing:

- Quality is reduced because of the noise created over there.
- It needs high quality processing
- Due to high quality it needs a costly hardware
- Storage requirements are also costly
- Consumes high power
- It also uses a higher data
- No security
- It is not easily implemented
- It cannot be saved
- It also cannot be transmitted under emergency

F.Tools used in analog signal processing:

- ✓ Convolution

This is which the signal is combined that is the input signal is combined with an output signal

- ✓ Fourier transform

The fourier transforms the signal to frequency domain and it works only in specific functions.

- ✓ Laplace tansform

It is similar to fourier transform but allows the transform not only to specific but also different systems.this is known as laplace transform.

- ✓ Bode plots

They are the plots of magnitude-frequency vs phase and frequency for a system.this is known as the bode plots.

V. Conclusion

This paper tells about what is signal processing and its concept on it. It also tells us about the types os signals they are the analog and digital – applications,advantages,disadvantages,tools used and some of the uses in it from the above it is clearly explained the signal processing.it is explained with examples on it.

VI. Reference

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