CONVERSION A/N POUR LES SYSTÈMES AUDIO

ANALOG TO DIGITAL CONVERSION

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| Lecturers : 0.0 | TC : 0.0 | PW : 4.0 | Autonomy : 0.0 | Study : 4.0 | Project : 0.0 | Language : FR

Objectives

Through the study of analog-digital conversion, this AF illustrates the complementarity of electronics and signal processing for the design of information management systems. The operation, simulation and then realization of an analog-digital converter "Sigma-Delta" will be studied. This converter has an excellent behaviour with respect to the quantization error inherent to the analog-to-digital conversion. These good performances justify its important use in the audio field for consumer applications such as CD recorders. In this AF, we focus on highlighting the link between the theoretical and technical aspects that accompany the design of an electronic system.

Keywords : Analog-to-digital conversion, electronic systems, Sigma-Delta modulator, digital signal, quantization, signal-to-noise ratio, filtering

Programme

- 1st session (BE 2 h): uniform conversion (Presentation of analogue / digital conversion; Principle and properties of uniform analog / digital conversion; Practical Activity (1h): Simulation and study of a uniform converter with matlab)
- 2d session (BE 2 h): Conversion Sigma-Delta (Principle and properties of the Sigma-Delta converter; Practical Activity (1h): Simulation and study of a Sigma-Delta converter under matlab / simulink)
- 3d session (TP 4 h): Electronic realization of a Sigma-Delta modulator (Design of the electronic circuit carrying out a Sigma-Delta modulation; Observation and analysis of signals in the space of time and frequency)

Learning outcomes

- Know how to describe the theoretical principle of the Sigma-Delta converter.
- Be able to conduct a simulation of the system under Matlab-Simulink.
- Being able to design an electronic circuit making a Sigma-Delta modulator.
- Be able to analyse signals in time and frequency.

Independent study

Objectifs : This activity is not concerned with framed autonomy activities outside personal work.

Méhodes : This activity is not concerned with framed autonomy activities outside personal work.

Core texts

Sangil Park., *PRINCIPLES OF SIGMA-DELTA MODULATION FOR ANALOG-TO-DIGITAL CONVERTERS.*, Rapport Technique Motorola APR8.
Joshua Reiss *UNDERSTANDING SIGMA–DELTA MODULATION: THE SOLVED AND UNSOLVED ISSUES.* , Journal of the Audio Engineering Society, 2008

Assessment

Final mark = 100% Know-how
Know-how mark = 100% continuous assessment