

Signal 2

Introducing

Description

I. Fourier Transform in $L^1(\mathbb{R})$ and $L^2(\mathbb{R})$

1. Definitions and properties
2. Inversion, derivability and convolution
3. Plancherel Theorem.
4. Shannon's Theorem.

II. Fourier transform of sequences

1. Definition, properties.
2. Convolution

III. Short time Fourier transform

1. Definition
2. Windowing and application to sound processing.

IV. Random Signals

1. Definition
2. ARMA process
3. Denoising in an orthogonal basis.

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

Fourier transform of integrable functions.

Fourier transform of sequences

Short time Fourier transform

Sampling Shannon's Theorem

Modelisation of random signals.

ARMA process

Signal denoising.

Necessary prerequisites

Undergraduate Analysis: integration, Fourier Series, Gaussian Vectors

Évaluation

L'évaluation des acquis d'apprentissage est réalisée en continu tout le long du semestre. En fonction des enseignements, elle peut prendre différentes formes : examen écrit, oral, compte-rendu, rapport écrit, évaluation par les pairs...

Practical info

Location(s)

 Toulouse