Traitement du signal

Component
École Nationale Supérieure d'Électrotechnique d'Électronique d'Informatique d'Hydraulique et des Télécommunications

In brief

- **Code ELP:** N6EN08A
- **Open to exchange students:** No

Presentation

Objectives

Understand the different classes of deterministic and random signals with the definitions of the autocorrelation function and the power spectrum density

Understand the concept of linear filtering and the Wiener Lee relationships

Understand the principles of sampling and the Shannon theorem

Understand the interest of non-linear transformations applied to deterministic and random signals and how to apply Price's theorem

Description

Autocorrelation and power spectral density

Sampling

Linear Filtering

Non-contractual information.
Last update on 25 October 2025

Non-linear transformations and Price's theorem

Pre-requisites

Bases on deterministic signals (energy, power, periodicity)

Random variables and vectors

Skills

Computation of autocorrelation functions and power spectrum densities for deterministic signals and stationary random processes

Shannon theorem

Compute the autocorrelation function and the power spectrum density at the ouput of a linear filter

Apply Price's theorem to stationary random processes

Bibliography

1. J. Max et J.-L. Lacoume, Méthodes et techniques de traitement du signal, Dunod, 5me édition, 2004.

2. Athanasios Papoulis and S. Unnikrishna Pillai, Probability, Random Variable and Stochastic Processes, McGraw Hill Higher Education, 4th edition, 2002.

Useful info

Non-contractual information.
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