1CC4000 – Signal Processing

Instructors: Charles Soussen
Department: DÉPARTEMENT SIGNAL, INFORMATION, COMMUNICATION
Language of instruction: FRANCAIS, ANGLAIS
Campus: CAMPUS DE PARIS - SACLAY
Workload (HEE): 40
On-site hours (HPE): 24,00

Description

Digital world produces huge amount of data of any kind (audio, image, video, physical measures) related to human activity in different domains such as healthcare, telecommunication, industry or environment. Processing the information of those signal is fundamental :

- For decision making (for instance in medical diagnosis),
- For information coding (for instance in data compression),
- For physical phenomenon analysis (for instance mechanical fault detection),
- For signal reconstruction (for instance to cancel noise in audio signals)

Signal Processing is at the crosspoint between mathematics, physics, and computer science. Mathematic concepts give tools to represent signals and to process them. Physical models allow one to link the measured data to the desired information. Lastly, computer science is necessary to operate the digital processing.

At the end of this course, students will be in grade to understand and use the deterministic and statistical signal processing methods in order to solve different kinds of problems related to information science, like filtering, information transmission, noise canceling, physical parameter estimation and spectral analysis. Those problems appear in many kinds of applications, like automatic recognition of musical tracks, radar localization, climatic data analysis, reconstruction of medical images in IRM, gravitational waves detection in astrophysics, innovative cellular network design (5G, IoT...).

Quarter number
ST4