2010-11 academic year

Perception and audiovisual cognition (21611)

Degree/study: Audiovisual Systems Engineering
Year: 2nd
Term: 3rd
Number of ECTS credits: 4 credits
Hours of studi dedication: 100 hours
Teaching language or languages: Catalan and Spanish
Teaching Staff: Gustavo Deco

1. Presentation of the subject

This Perception and Audiovisual Cognition course is taught during the 3rd term of the 2nd academic year of the degree on Computer Science, Audiovisual Systems Engineering and Telematics Engineering.

The aim of this subject is to be an introduction to the elemental algorithms for machine learning, which are inspired on biology, and more precisely on neuroscience. The first part of the course will consist of a brief introduction to the biology of visual and auditory systems of human beings, on the one hand, and of an introduction to the more basic neural models, on the other one. Some of this knowledge will be an inspiration for the design of algorithms that seek to artificially implement some basic tasks of visual and auditory systems, such as classification, identification and segregation of auditory and visual objects. These tasks are the basis of perception and cognition.

The methodology is based on two main aspects: the theory sessions, and the seminar sessions and practical labs, where students will experience some of the concepts covered during the theory sessions of the course.

This course has an important theory component (physiology of auditory and visual systems, neural models, learning algorithms) but the application of this knowledge to specific problems related to visual perception and cognition is also fundamental. Resolving these exercises requires the mastery of mathematical tools (such as linear algebra, calculus in one and several variables and probability) and programming.

2. Competences to be attained

Instrumental

i. Capacity for analysis and synthesis.
ii. Troubleshooting.
iii. Ability to organize and plan.
iv. Capacity for abstraction.

Interpersonal

i. Critical reasoning.

Systemic

i. Research skills.
ii. Ability to learn new theory concepts.
iii. Ability to work in groups.
iv. Practical application of theoretical knowledge.