Universidad Zaragoza

Academic Year/course: 2024/25

67245 - Electronic systems for access control and security

Syllabus Information

Academic year: 2024/25
Subject: 67245 - Electronic systems for access control and security
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 622 - Master's in Electronic Engineering
ECTS: 6.0
Year: 1
Semester: Second semester
Subject type: Optional
Module:

1. General information

In the context of intelligent environments, access control by user identification is one of the key issues to be addressed. This course addresses several fields of application in intelligent environments, ranging from the micro system made up of a terminal and a user, to more complex environments such as a city or road infrastructure.

2. Learning results

Learn about the different existing technologies in automatic identity dentification, distinguishing which is the ideal technology according to the field of application.

Evaluate different verification algorithms, providing the rate of false acceptance and false rejection.

Design and evaluate electronic systems for their application in access control and/or automatic identification of people and goods.

Student is able to continue learning continuously and autonomously.

3. Syllabus

Theory

T1: Introduction to Machine Learning

T2: Introduction to Electronics systems for Access control

T3: Biometrics

T4: Traffic monitoring and vial security

T5: Video-surveillance

Laboratory sessions

S1: Access control system using Python on a microcontroller

S2: RFID-based access control system

S3: Facial biometrics

S4: Motion detection

S5: Tracking: traffic monitoring application

S6: Video-surveillance application

4. Academic activities

Lectures (20h)

The fundamental contents of the course will be introduced.

Practice sessions (10h)

In this activity, a set of representative problems will be solved.

Laboratory sessions (18h)

Representative examples will be carried out in the laboratory.

Assignments (36h)

Individual or group assignments will be proposed, in the form of a course project. The assessment criteria is based on: difficulty, development, achieved results, quality of the written report and oral presentation.

Study (60h)

Study, preparation of laboratory work and time for preparing the final exam. Students can also attend tutorials to solve specific problems.

Evaluation activities (6h)

Assessment.

5. Assessment system

The subject will be evaluated only in the global evaluation modality through the following activities:

- Test 1: Theoretical exam: rating from 0 to 10 points (**20% final grade**). There will be an individual written exam made up of several multiple choice or short answer questions.

- Test 2: Laboratory exam: rating from 0 to 10 points (**30% final grade**). Students who have obtained a practical qualification greater than or equal to 4 points during the course will be exempt from this exam. The exam will consist of solving a case similar to those developed during the course in the laboratory practice sessions.

- Test 3: Oral presentation of practical work: qualification from 0 to 10 points (**50% final grad**e). Both the report submitted and the suitability and originality of the proposed solution will be taken into account.

6. Sustainable Development Goals

3 - Good Health & Well-Being
9 - Industry, Innovation and Infrastructure
11 - Sustainable Cities and Communities