Guia docent
220144 - 220144 - Uav Sensors i Aplicacions

Última modificació: 22/04/2021

Unitat responsable: Escola Superior d'Enginyeries Industrial, Aeroespacial i Audiovisual de Terrassa
Unitat que imparteix: 220 - ETSEIAT - Escola Superior d'Enginyeries Industrial i Aeronàutica de Terrassa.

Titulació: GRAU EN ENGINYERIA EN TECNOLOGIES AEROESPACIALS (Pla 2010). (Assignatura optativa).
GRAU EN ENGINYERIA EN VEHICLES AEROESPACIALS (Pla 2010). (Assignatura optativa).

Curs: 2021 **Crèdits ECTS:** 3.0 **Idiomes:** Anglès

PROFESSORAT

Professorat responsable: Manel Soria

Altres:

METODOLOGIES DOCENTS

OBJECTIUS D'APRENENTATGE DE L'ASSIGNATURA

To understand how different types of imaging sensors operate (RGB cameras, multispectral cameras, hyperspectral cameras) and how they can be used to gather useful information about the environment.

To obtain a panoramic of the current applications of UAVs for civilian applications.

To acquiere a hands-on experience reading and post-process UAV data.

HORES TOTALS DE DEDICACIÓ DE L'ESTUDIANTAT

Tipus	Hores	Percentatge
Hores grup gran	30,0	40.00
Hores aprenentatge autònom	45,0	60.00

Dedicació total: 75 h

CONTINGUTS

Module 1: Introduction to imaging sensors

Descripció:
The fundamentals of image sensors will be described. The sensors to be described include monochrome cameras, color (RGB) cameras, multispectral cameras, hyperspectral cameras and thermal imaging cameras.

Dedicació: 25h
Grup gran/Teoria: 10h
Aprenentatge autònom: 15h

Module 2: Introduction to image processing for UAV applications

Descripció:
Digital representation of images. Data types used for image representation. Loosely compressed and non-compressed image formats. Monochrome and color images. Contrast enhancement algorithms. RGB and HSV images. Processing of multispectral and hyperspectral images. Binary images. Morphological image processing. Image segmentation. Image registration. Application examples.

Dedicació: 25h
Grup gran/Teoria: 10h
Aprenentatge autònom: 15h

Module 3: Guided project

Descripció:
The students will select the subject of their project in agreement with the professor. It will be based on a UAV imaging system (including spacecraft images). The students creativity in the selection of a project will be encouraged.

Some examples of possible bibliographic works are:
-Processing of spacecraft RAW images.
-Band-pass filters for multispectral imaging systems

Some examples of possible practical projects are:
-Characterization of a micro UAV camera
-Segmentation of planetary images
-Tracking of objects in a video

The students will work in groups. Each group will submit a report of the project, as well as a video presentation of their work.

Dedicació: 25h
Grup gran/Teoria: 10h
Aprenentatge autònom: 15h

SISTEMA DE QUALIFICACIÓ