

220144 - Uav Sensors i Aplicacions

Unitat responsable: 205 - ESEIAAT - Escola Superior d'Enginyeries Industrial, Aeroespacial i Audiovisual de Terrassa

Unitat que imparteix: 220 - ETSEIAT - Escola Superior d'Enginyeries Industrial i Aeronàutica de Terrassa

Curs: 2019

Titulació: GRAU EN ENGINYERIA EN TECNOLOGIES AEROESPACIALS (Pla 2010). (Unitat docent Optativa)
GRAU EN ENGINYERIA EN VEHICLES AEROESPACIALS (Pla 2010). (Unitat docent Optativa)

Crèdits ECTS: 3 Idiomes docència: Anglès

Professorat

Responsable: Manel Soria

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

Hores totals de dedicació de l'estudiantat

Dedicació total: 75h	Hores grup gran:	30h	40.00%
	Hores aprenentatge autònom:	45h	60.00%

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Continguts

<p>Module 1: Introduction to imaging sensors</p>	<p>Dedicació: 25h Grup gran/Teoria: 10h Aprentatge autònom: 15h</p>
<p>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.</p>	
<p>Module 2: Introduction to image processing for UAV applications</p>	<p>Dedicació: 25h Grup gran/Teoria: 10h Aprentatge autònom: 15h</p>
<p>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.</p>	
<p>Module 3: Guided project</p>	<p>Dedicació: 25h Grup gran/Teoria: 10h Aprentatge autònom: 15h</p>
<p>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.</p> <p>Some examples of possible bibliographic works are: -Processing of spacecraft RAW images. -Band-pass filters for multispectral imaging systems</p> <p>Some examples of possible practical projects are: -Characterization of a micro UAV camera -Segmentation of planetary images -Tracking of objects in a video</p> <p>The students will work in groups. Each group will submit a report of the project, as well as a video presentation of their work.</p>	

Bibliografia