



UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH

Escola Politècnica Superior d'Enginyeria
de Manresa



Treball Final de Grau

***DETECCIÓ DE PERSONES
MITJANÇANT
ALGORITMES DE VISIÓ
ARTIFICIAL***

**Grau en Enginyeria Electrònica
Industrial i Automàtica**

Curs 21/22

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2. Annexos

2.1 *Llistat de llibreries*

Llibreries
os
glob
tkinter
numpy
six.moves.urllib
sys
tensorflow
PIL
object_detection.utils
tensorflow.compat.v1
PySimpleGUI
os.path
cv2
matplotlib
pandas
re
ctypes
csv
pafy




2.2 *Panoràmica*








2.3 Resultats experimentals

2.3.1 Video entorn entrenament

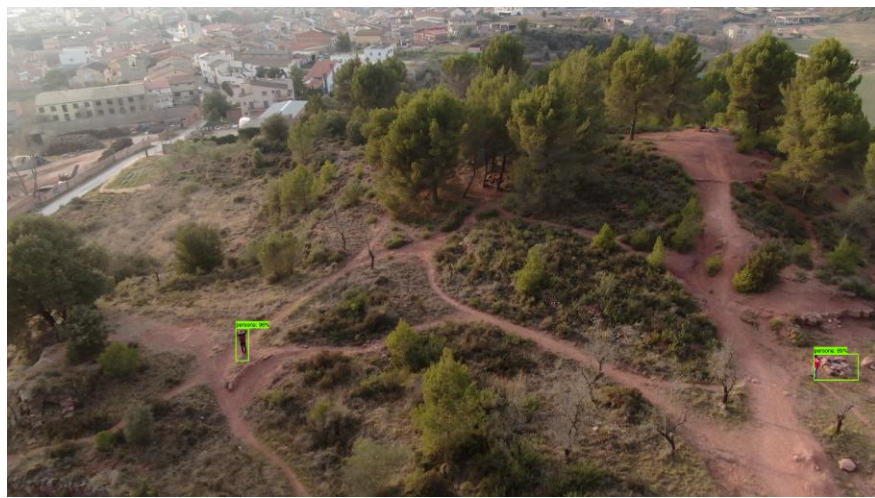
Frame num	Imatges processades
775	 <p>An aerial photograph of a hillside with a dirt path. A person is walking on the path, and a green bounding box is drawn around them. In the background, a town and a church are visible on a hill.</p>
800	 <p>An aerial photograph of a hillside with a dirt path. Two people are walking on the path, and green bounding boxes are drawn around both of them. The background shows a town and a church on a hill.</p>
825	 <p>An aerial photograph of a hillside with a dirt path. A person is walking on the path, and a green bounding box is drawn around them. The background shows a town and a church on a hill.</p>

850	
875	
900	

925









950









975









1000	
1025	
1050	




1075	 An aerial photograph showing a network of dirt paths winding through a hilly, vegetated area. A single person is visible on one of the paths, highlighted by a green bounding box with a small label above it. In the background, some buildings and a road are visible.
1100	 An aerial photograph showing a network of dirt paths winding through a hilly, vegetated area. Two people are visible on different paths, each highlighted by a green bounding box with a small label above it.
1125	 An aerial photograph showing a network of dirt paths winding through a hilly, vegetated area. A single person is visible on one of the paths, highlighted by a green bounding box with a small label above it.




1150	 An aerial photograph showing a network of dirt paths winding through a scrubland area with sparse green bushes and trees. A person is visible on one of the paths, highlighted by a green bounding box with a small label above it.
1175	 An aerial photograph showing a network of dirt paths winding through a scrubland area with sparse green bushes and trees. A person is visible on one of the paths, highlighted by a green bounding box with a small label above it.
1200	 An aerial photograph showing a network of dirt paths winding through a scrubland area with sparse green bushes and trees. A person is visible on one of the paths, highlighted by a green bounding box with a small label above it.




1225	 An aerial photograph showing a network of dirt paths winding through a landscape of low-lying green and brown vegetation. A small figure of a person is visible on one of the paths, enclosed within a green rectangular bounding box. The terrain appears to be a natural, unpaved area.
1250	 This image is a duplicate of the first one, showing the same aerial view of a dirt path with a person highlighted by a green bounding box.
1275	 This image is also a duplicate of the first one, showing the same aerial view of a dirt path with a person highlighted by a green bounding box.



1300	 An aerial photograph showing a network of dirt paths winding through a landscape of dry brush and small trees. A person is visible on one of the paths, highlighted by a green rectangular bounding box.
1325	 An aerial photograph showing a network of dirt paths winding through a landscape of dry brush and small trees. A person is visible on one of the paths, highlighted by a green rectangular bounding box.
1350	 An aerial photograph showing a network of dirt paths winding through a landscape of dry brush and small trees. A person is visible on one of the paths, highlighted by a green rectangular bounding box.




1375	 An aerial photograph showing a network of dirt paths winding through a hilly, vegetated area. A person is visible on one of the paths, highlighted by a green bounding box. The terrain is covered with low-lying green and brown shrubs.
1400	 An aerial photograph showing a network of dirt paths winding through a hilly, vegetated area. A person is visible on one of the paths, highlighted by a green bounding box. The terrain is covered with low-lying green and brown shrubs.
1425	 An aerial photograph showing a network of dirt paths winding through a hilly, vegetated area. A person is visible on one of the paths, highlighted by a green bounding box. The terrain is covered with low-lying green and brown shrubs.




1450	 An aerial photograph showing a network of dirt trails winding through a hilly, vegetated area. A small figure of a person is visible on one of the trails, enclosed in a green rectangular bounding box. The terrain is covered with low-lying green and brownish vegetation.
1475	 An aerial photograph showing a network of dirt trails winding through a hilly, vegetated area. A small figure of a person is visible on one of the trails, enclosed in a green rectangular bounding box. The terrain is covered with low-lying green and brownish vegetation.
1500	 An aerial photograph showing a network of dirt trails winding through a hilly, vegetated area. A small figure of a person is visible on one of the trails, enclosed in a green rectangular bounding box. The terrain is covered with low-lying green and brownish vegetation.

1525	 An aerial photograph showing a network of dirt paths winding through a landscape with sparse green vegetation and trees. A small figure of a person is visible on one of the paths, enclosed in a green rectangular bounding box. The person appears to be walking away from the camera.
1550	 An aerial photograph showing a network of dirt paths winding through a landscape with sparse green vegetation and trees. A small figure of a person is visible on one of the paths, enclosed in a green rectangular bounding box. The person appears to be walking away from the camera.
1575	 An aerial photograph showing a network of dirt paths winding through a landscape with sparse green vegetation and trees. A small figure of a person is visible on one of the paths, enclosed in a green rectangular bounding box. The person appears to be walking away from the camera.




1600	 An aerial photograph of a dirt trail winding through a hilly, brush-covered landscape. A person is visible on the trail, highlighted by a green bounding box. The terrain is reddish-brown with sparse green vegetation.
1625	 An aerial photograph of a dirt trail winding through a hilly, brush-covered landscape. A person is visible on the trail, highlighted by a green bounding box. The terrain is reddish-brown with sparse green vegetation.
1650	 An aerial photograph of a dirt trail winding through a hilly, brush-covered landscape. A person is visible on the trail, highlighted by a green bounding box. The terrain is reddish-brown with sparse green vegetation.




1675	 An aerial photograph showing a network of dirt trails winding through a hilly, vegetated landscape. A person is visible on one of the trails, highlighted by a green bounding box. The terrain is covered with low-lying green and brownish vegetation.
1700	 An aerial photograph showing a network of dirt trails winding through a hilly, vegetated landscape. A person is visible on one of the trails, highlighted by a green bounding box. The terrain is covered with low-lying green and brownish vegetation.
1725	 An aerial photograph showing a network of dirt trails winding through a hilly, vegetated landscape. A person is visible on one of the trails, highlighted by a green bounding box. The terrain is covered with low-lying green and brownish vegetation.

1750	 An aerial photograph showing a network of dirt paths winding through a hilly, wooded area. A person is visible on one of the paths, highlighted by a green bounding box. The terrain is covered with green trees and shrubs, and the paths are reddish-brown.
1775	 An aerial photograph showing a network of dirt paths winding through a hilly, wooded area. A person is visible on one of the paths, highlighted by a green bounding box. The terrain is covered with green trees and shrubs, and the paths are reddish-brown.
1800	 An aerial photograph showing a network of dirt paths winding through a hilly, wooded area. A person is visible on one of the paths, highlighted by a green bounding box. The terrain is covered with green trees and shrubs, and the paths are reddish-brown.

1825	 An aerial photograph showing a network of dirt paths in a hilly, vegetated area. A person is standing at a junction of paths, highlighted by a green bounding box. Another person is visible in the upper right corner, also highlighted by a green bounding box.
1850	 An aerial photograph showing a network of dirt paths in a hilly, vegetated area. A person is standing at a junction of paths, highlighted by a green bounding box.
1875	 An aerial photograph showing a network of dirt paths in a hilly, vegetated area. A person is standing at a junction of paths, highlighted by a green bounding box.

1900	
1925	
1950	

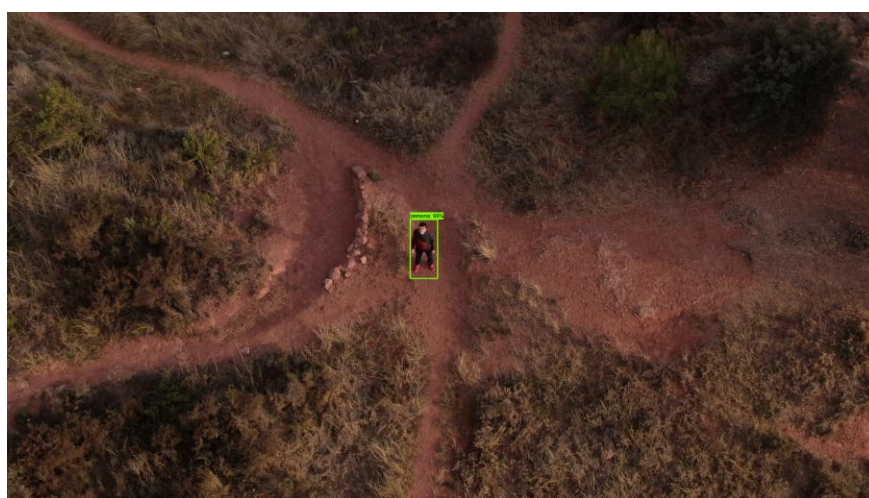
1975	 An aerial photograph showing a dirt path junction in a natural, brushy environment. A person is visible at the junction, highlighted by a green bounding box with a small label above it.
2000	 An aerial photograph showing the same dirt path junction as in 1975. A person is visible at the junction, highlighted by a green bounding box with a small label above it.
2025	 An aerial photograph showing the same dirt path junction as in 1975 and 2000. A person is visible at the junction, highlighted by a green bounding box with a small label above it.

2050	 An aerial photograph showing a dirt path that splits into two directions. A person is standing at the junction, highlighted by a green bounding box. The surrounding area is covered with dry grass and some green shrubs.
2075	 An aerial photograph showing a dirt path that splits into two directions. A person is standing at the junction, highlighted by a green bounding box. The surrounding area is covered with dry grass and some green shrubs.
2100	 An aerial photograph showing a dirt path that splits into two directions. A person is standing at the junction, highlighted by a green bounding box. The surrounding area is covered with dry grass and some green shrubs.

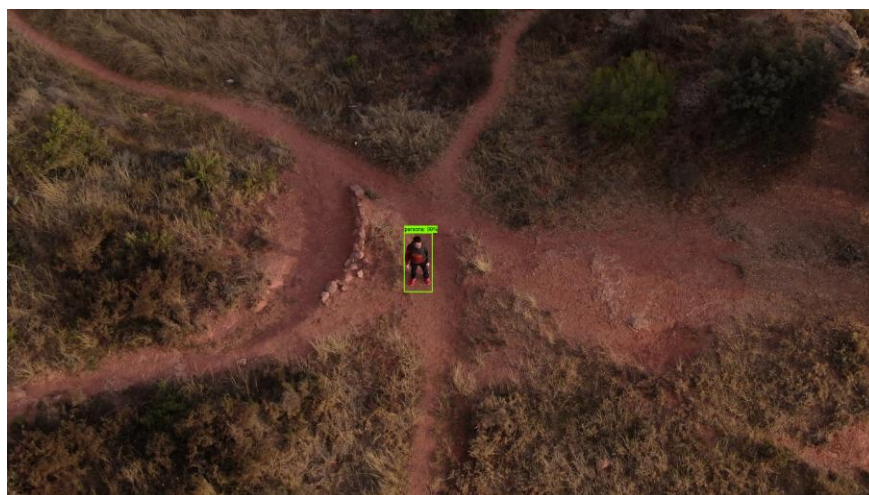
2125



2150



2175



2200









2225



2250



2275	 An aerial photograph showing a person standing on a dirt path in a natural, brushy environment. The person is wearing a red jacket and dark pants. A green bounding box is drawn around the person, and a small green label 'person' is visible above the box.
2300	 An aerial photograph showing a person standing on a dirt path. The person is wearing a red jacket and dark pants. A green bounding box is drawn around the person, and a small green label 'person' is visible above the box.
2375	 An aerial photograph showing a person standing on a dirt path. The person is wearing a red jacket and dark pants. A green bounding box is drawn around the person, and a small green label 'person' is visible above the box.

2400	 An aerial photograph showing a person standing on a dirt path in a natural, brushy environment. The person is wearing a dark jacket and dark pants. A green bounding box is drawn around the person, indicating their detection by a computer vision algorithm.
2425	 An aerial photograph showing a person standing on a dirt path in a natural, brushy environment. The person is wearing a dark jacket and dark pants. A green bounding box is drawn around the person, indicating their detection by a computer vision algorithm.
2450	 An aerial photograph showing a person standing on a dirt path in a natural, brushy environment. The person is wearing a dark jacket and dark pants. A green bounding box is drawn around the person, indicating their detection by a computer vision algorithm.

2475






2500








2525






2.3.2 Video entorn diferent

Frame num	Imatges processades
25	
50	
75	

100	 <p>Two people are visible on a dirt path. The person on the left is enclosed in a green bounding box with the label "persona: 60%". The person on the right is enclosed in a green bounding box with the label "persona: 92%".</p>
125	 <p>Two people are visible on a dirt path. The person on the right is enclosed in a green bounding box with the label "persona: 67%".</p>
150	 <p>Two people are visible on a dirt path. The person on the left is enclosed in a green bounding box with the label "persona: 54%". The person on the right is enclosed in a green bounding box with the label "persona: 67%".</p>

175	 <p>persona: 76%</p> <p>persona: 84%</p>
200	 <p>persona: 69%</p>
225	 <p>persona: 74%</p>

250	 <p>persona: 60%</p>
275	 <p>persona: 75%</p>
300	 <p>persona: 90%</p>

325



350



375



400	<p>An aerial photograph of a dirt path in a rocky, mountainous area. Two people are visible on the path. The first person is located at approximately [165, 428, 180, 473] with a detection label 'persona: 54%'. The second person is at [205, 540, 220, 585] with a detection label 'persona: 87%'. The path is light-colored and surrounded by green grass and grey rocks.</p>
425	<p>An aerial photograph of the same dirt path. Two people are visible. The first person is at [400, 428, 415, 473] with a detection label 'persona: 74%'. The second person is at [440, 540, 455, 585] with a detection label 'persona: 95%'. The scene is consistent with the previous image.</p>
450	<p>An aerial photograph of the same dirt path. Two people are visible. The first person is at [670, 540, 685, 585] with a detection label 'persona: 76%'. The second person is further up the path and is not labeled. The scene is consistent with the previous images.</p>

475









500



525



550	 <p>Two people are detected on a dirt path. The first person is labeled 'persona: 76%' and the second person is labeled 'persona: 63%'.</p>
575	 <p>One person is detected on a dirt path. The person is labeled 'persona: 75%'.</p>
600	 <p>Two people are detected on a dirt path. The first person is labeled 'persona: 74%' and the second person is labeled 'persona: 54%'.</p>

625	 An aerial photograph of a dirt path in a rocky, grassy area. A person is walking on the path, highlighted by a green bounding box with the label "persona: 76%".
675	 An aerial photograph of a dirt path in a rocky, grassy area. A person is walking on the path, highlighted by a green bounding box with the label "persona: 73%".
700	 An aerial photograph of a dirt path in a rocky, grassy area. A person is walking on the path, highlighted by a green bounding box with the label "persona: 55%".

725



750



775

