Data associated with each image of the Corsican Fire Database

Each image of the **Corsican Fire database** is characterized by the following data:

1. Spectral range of the image
2. Camera model
3. Sensitivity
4. Exposure time
5. Time of the shot
6. Moment of the day: day / night
7. Camera – fire distance: close / distant
8. Place
9. Region
10. GPS Position
11. Direction of propagation of the fire : towards the right, towards the left, coming closer, moving away
12. Vegetation type : wood chips, low bush, top bush, trees, unknown
13. Colour of the smokes
14. Presence of clouds
15. Presence of trucks, men
16. Ground truth
17. Image dimensions
18. Fire areas percentage in the image
19. Dominant colour of the fire
20. Level of texture of the fire
21. Fire/smoke covering percentage
22. Environment brightness

The data numbered from 1 to 15 are entered by hand by the owner of the image when the information is available.

Spectral range of the image: the spectrum in which the image was acquired: visible, near - infrared (**NIR**) (0.74-1µm), infrared shortwave (**SWIR**) (1-3 µm), medium infrared wavelengths (**MWIR**): (3-5µm), infrared wavelengths (**LWIR**) 8-14µm.

Camera model: the model of camera used to take the picture.

Sensitivity: the reactivity of the sensitive surface to light (sensor). The standard used is ISO.

Exposure time: the time during which the shutter of the camera (the part that isolates the sensor from light) opens.

Time of the shot: the time when the image was acquired. Its format is HH: MM: SS.

Moment of the day: this is the time of day during which the image was taken: You have to specify if day or night**.**

Camera – fire distance: distance indicator. You have to specify if close or distant**.**

Place: name of the city where the image was taken.

Region: name of the region where the image was taken.

GPS Position: it is the GPS position in LLH format (latitude, longitude, height) of the camera when the image was taken.

Direction of propagation of the fire: you have to specify towards the right, towards the left, coming closer, moving away.

Vegetation type: it is the vegetation inside which the fire spreads. You have to specify: wood chips, low bush, top bush, trees, unknown.

Color of the smokes: the dominant colour of the smokes issued by the fire. You have to specify: black, grey, white.

Presence of clouds: presence of clouds indicator. You have to specify: yes or no**.**

Presence of trucks, men: this field allows to specify the nature of elements in the photo with colors identical to fires such as trucks or men. You have to specify trucks, man, other or none.

Ground truth (information N°16) is an image in black and white with the white manually segmented from the original image corresponds to the fire pixels.

Original image

Ground truth

The features numbered from 17 to 22 are automatically calculated as follows:

Image dimensions: the width and height of the image are obtained automatically when loading the image in the image processing software.

Fire areas percentage in the image: the ratio of fire pixels (identified from the ground truth image) on the total number of pixels in the image. This rate is considered low if its value belongs to the range [0-20], medium if its value is in the range]20-45] and high if its value belongs to the range]45-100].

Dominant color of the fire: the pixels belonging to the fire (and identified with the ground truth) are classified into three categories: red, orange and yellow - white. Each fire pixel is labeled in one of these three colors using the TSL color space that makes it easy to distinguish colors by their hue (channel T). The dominant color of the fire associated with an image is the one of the pixels that are in greater number in the image.

Original image
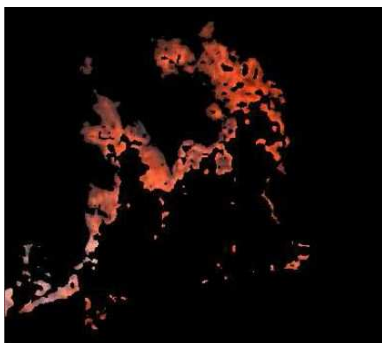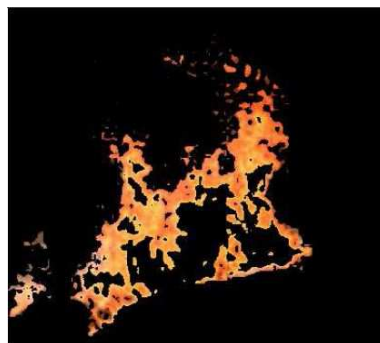
Red color pixels   Orange color pixels   Yellow-white color pixels

Texture of the fire: a process based on a statistical method of histograms is used to determine if the fire areas present in the images have a high level of texture and low level of texture.


Fire with a high level of texture   Fire with a low level of texture

Fire/smoke covering percentage: the quotient of the number of fire pixels detected with smoke on the total number of fire pixels. The learning method of Vector Support Machines was used to discriminate among the pixels of a fire area identified by the ground truth those which are superimposed by smoke. The fire/smoke covering rate is considered low if its value belongs to the range [0-20], medium if its value is in the range] 20-45] and high if its value lies in the interval]45-100].

Original image
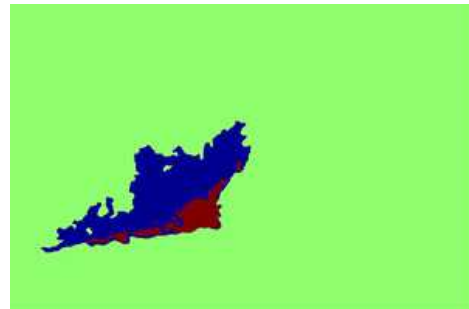
Pixels classification: the blue pixels have been identified with smoke and the red pixels without smoke and the red pixels without smoke

Environment brightness: the total of the intensities in the canal L of the STL system of the environment pixels (those outside of the fire areas delineated in the ground truth) divided by the number of pixels of the environment. The environment brightness is considered to be low if its value is between 0 and 50, and high if it is strictly greater than 50.