

GEO OSInt



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Activity

- *Acquiring sources for analysis*
- *Data analysis*
- *Diagramming elements*
- *Searching for matching targets on the map*
- *Confirming targets with additional elements*



Data Analysis

Images or videos can come from devices like phones, cameras, from storage media, or online. If the data is on social media platforms, you might be prevented from downloading it. A straightforward solution is to search for a specific downloader for that social platform on Google, for example, "Youtube video downloader". Once you find the appropriate tool, simply copy the full URL of the page where the video is located, paste it into the provided field, and follow the instructions on the site offering this service to download the video to your PC.



Data Analysis

If we're lucky and the multimedia material doesn't come from messaging platforms or social media that remove data during uploading, we can extract EXIF data which, in some cases, can contain the geographical coordinates of where the video or image was created. To perform this analysis, we can use the software "Exif Tool", which is available for free download from the developer's website.



Using ExifTool

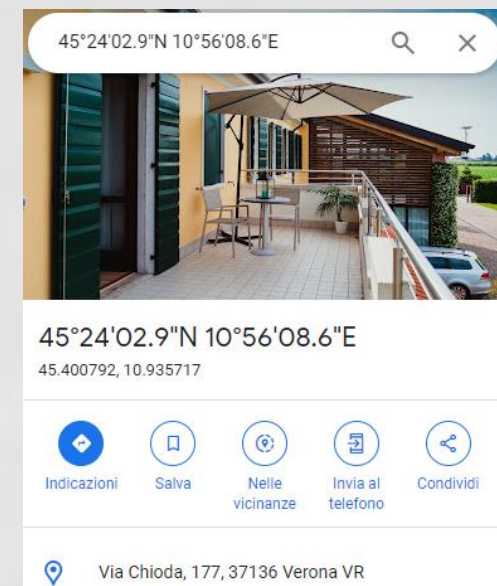
After downloading the program, place the videos/photos in the same folder as the executable. Open the terminal and navigate to the same folder to extract the EXIF data. For a photo, you would type "exiftool(-k).exe" IMG_9781.jpg.

```
C:\Users\trax\Documents\progs\exiftool-12.78>"exiftool(-k).exe" IMG_9781.jpg
ExifTool Version Number      : 12.78
File Name                    : IMG_9781.jpg
Directory                    : .
```

If the capturing device had location services enabled, you will find the GPS coordinates in the Degrees Minutes Seconds format, for example: 45 deg 24' 2.85" N 10 deg 56' 8.58" E

```
Field Of View                : 58.7 deg
Focal Length                 : 2.9 mm (35 mm equivalent: 32.0 mm)
GPS Position                 : 45 deg 24' 2.85" N, 10 deg 56' 8.58" E
Hyperfocal Distance         : 1.39 m
Light Value                  : 6.0
```

Removing the "deg" from the data and pasting it all into Google Maps' search field will give you the exact location



Data Analysis

Since luck is not always on our side and we might not find EXIF GPS data, or the images and videos come from social networks or messaging systems that "clean" the multimedia file by deleting all metadata, we must proceed differently by trying to capture useful elements from what we see to identify the exact location where the photo was taken or the video was recorded.



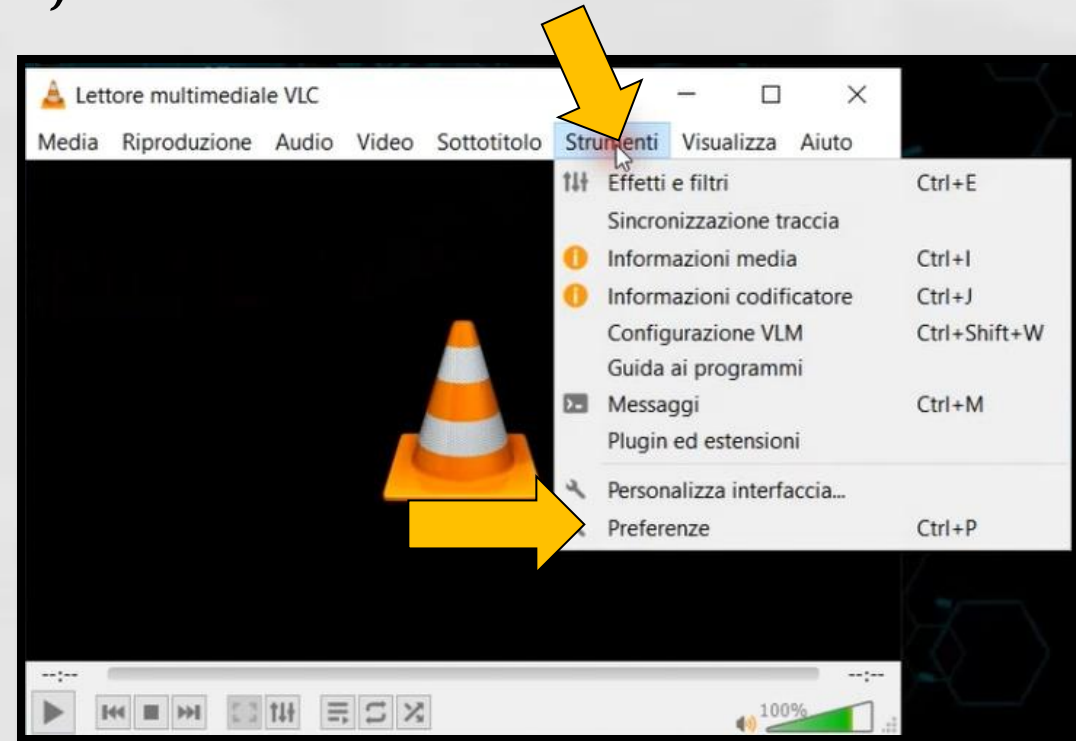
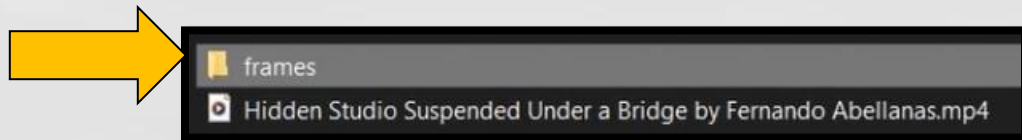
Data Analysis

If the information is in a video, I recommend breaking it down into individual frames. This technique will also be useful in other situations and will allow you to easily evaluate each frame of the video without risking missing any details. To perform this operation, you do not need any commercial software, just the well-known VLC program, which is available for free download.



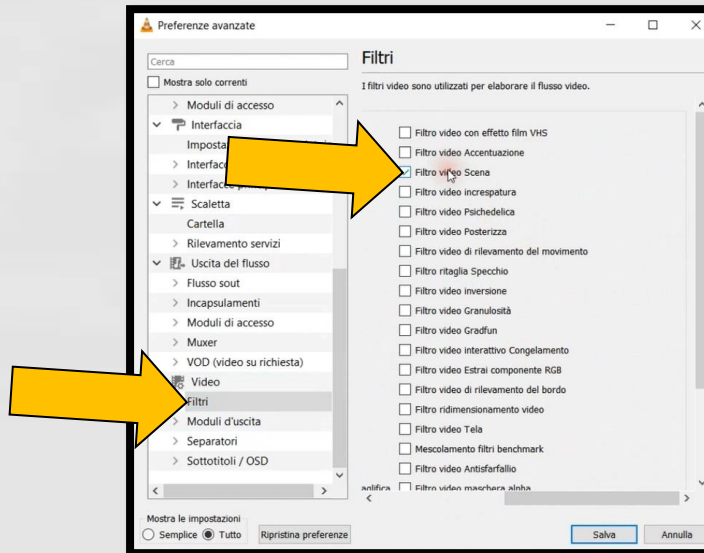
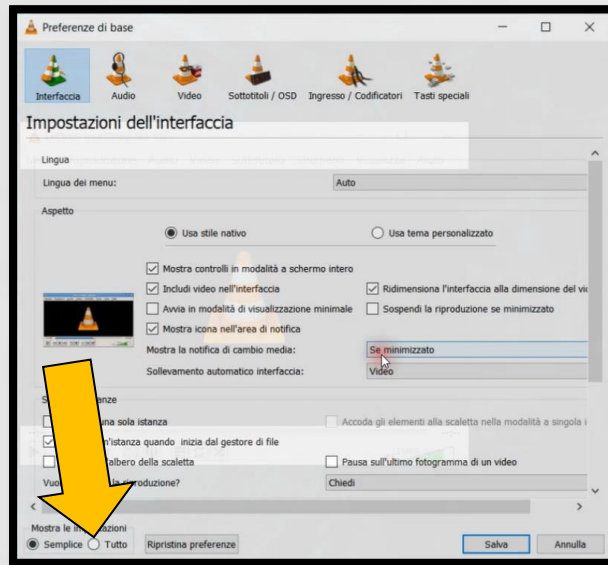
Saving frames with VLC

Create a folder, for example, named "frames", then start the VLC program, open the "Tools" menu, and select "Preferences".



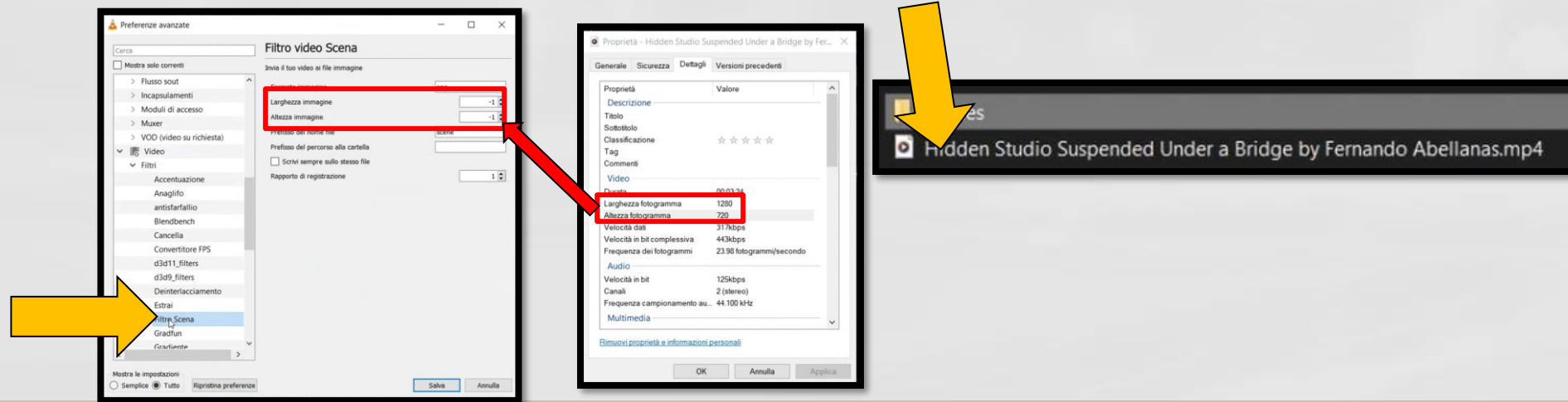
Saving frames with VLC

In the interface section at the bottom right, set "Show settings" to "All", which will reveal advanced parameters. Click on "Filters" in the left list and activate the "Scene Filter" on the panel that appears.



Saving frames with VLC

In VLC, by expanding the "Filters" section in the left menu, select "Scene Filter". For the video you want to break down, right-click to open the menu, then select "Properties". From the panel that appears, copy the video dimensions (in this case, 1280x720) into the corresponding panel in VLC.



Saving frames with VLC

In VLC, in the folder path field, enter the path of the "frames" folder you previously created. In the recording ratio box, enter the value 1, which sets capturing every single frame of the video.

Filtro video Scena

Invia il tuo video ai file immagine

Formato immagine: png

Larghezza immagine: 1280

Altezza immagine: 720

Prefisso del nome file: scene

Prefisso del percorso alla cartella: OSInt\valencia\frames

☐ Scrivi sempre sullo stesso file

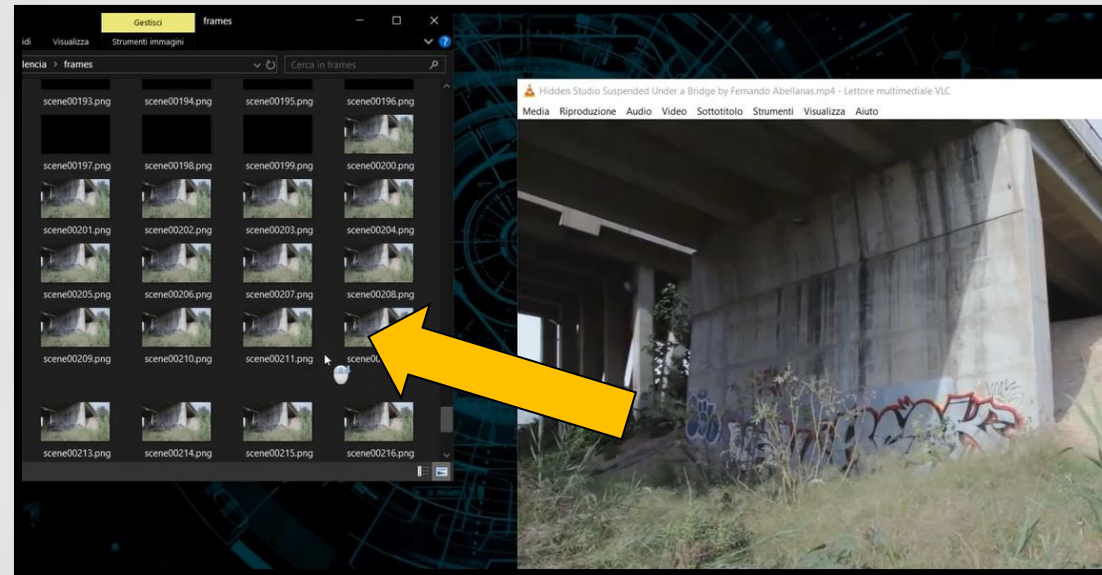
Rappporto di registrazione: 1



Saving frames with VLC

Close and reopen VLC for the changes to take effect. Now, load the video for playback and watch it from start to finish. If you open the "frames" folder, you can already see all the frames being created.

Remember to uncheck the "Scene Video Filter" at the end of the extraction process; otherwise, every video you play will be converted into frames in the previously set folder.



Data Analysis

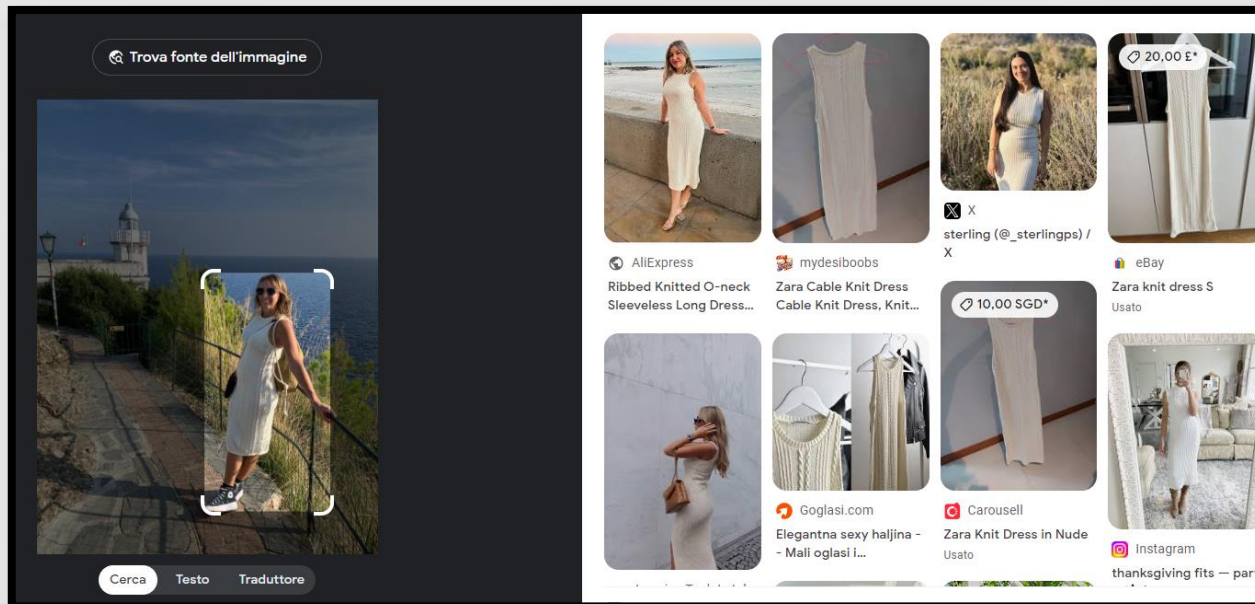
Now that we have the data, we isolate the important images that will help us identify a place. If the photos include images depicting monuments, buildings, or particular structures, we can attempt an initial search by image. Let's use a real example with this photo.



Image Search on Google Images

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Try uploading the image to Google Images by clicking on the icon indicated by the arrow. In this case, Google automatically focused the search on the person, giving us results related to their outfit



In questo caso, in automatico, Google ha focalizzato la ricerca sulla persona dandoci dei risultati relativi al suo abito.



Image Search on Google Images

Simply move the selection box over the image above the lighthouse to get results consistent with our search, revealing the exact location where the photo was taken, near the "Portofino Lighthouse"

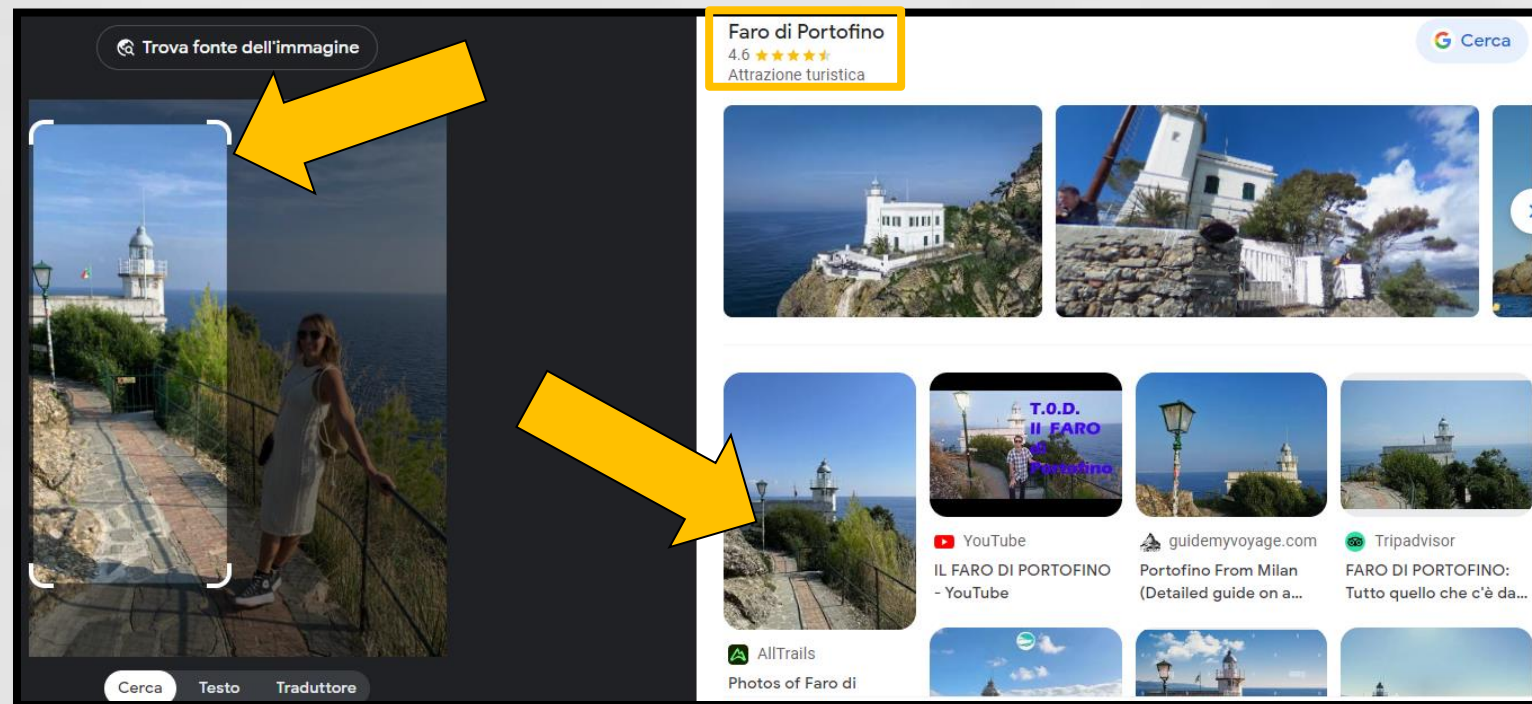
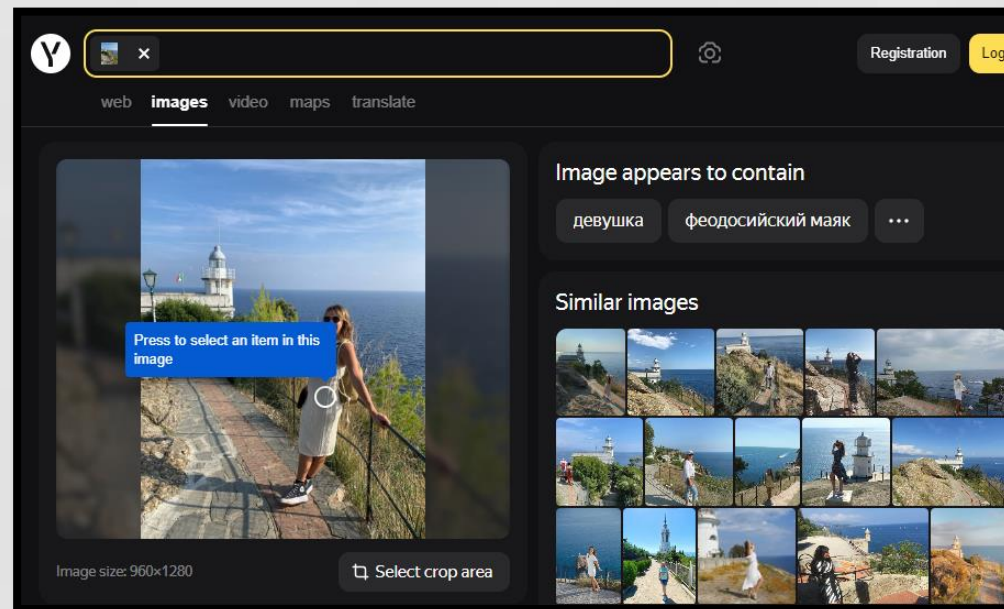
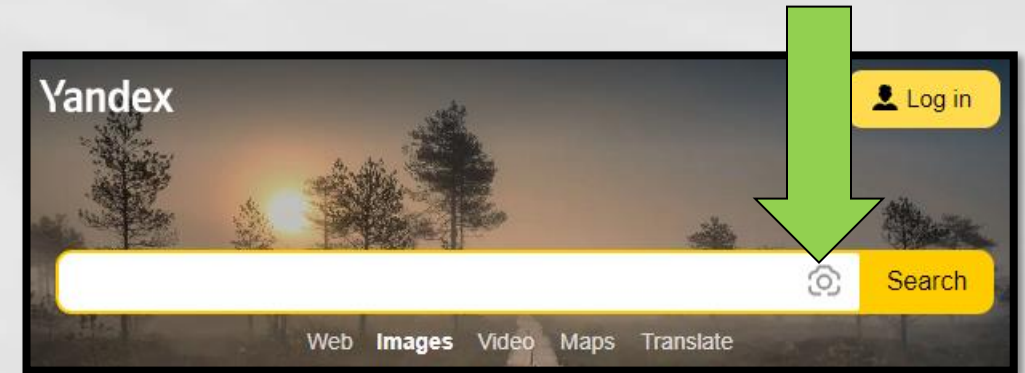


Image Search on Yandex Images

Yandex is a Russian search engine with image search capabilities similar to Google's. Let's try uploading the image by clicking on the icon indicated by the arrow.



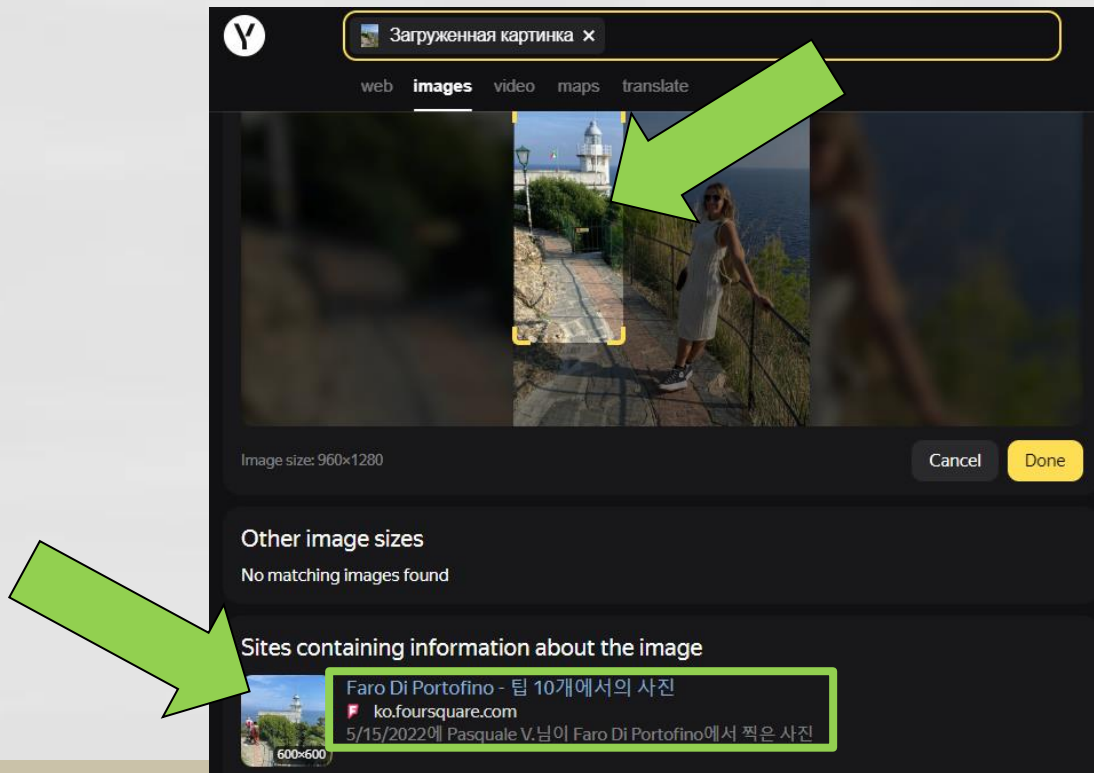
Like Google, the search engine initially focused on the person, but it still provided a series of images mostly taken in the same location.



Image Search on Yandex Images

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By moving the selection box over the image above the lighthouse, we can get results that align with our search, revealing the exact location where the photo was taken, which is near the "Portofino Lighthouse".



Data Analysis

If image search does not yield any useful results, you'll need to identify elements that can help. License plates, road signs, store signs, rivers, mountains, coastlines, etc., can provide useful clues.



Data Analysis Example

An example is provided using a video titled "secret studio" available on YouTube at <https://youtu.be/iWoLwxDcCEY>. The author of the video, made in Valencia, explicitly states not wanting to reveal their exact location. The only certain element is the city, which is declared at the beginning of the video.

The studio was conceived as a "refuge in the city" where movable walls encloses the tiny space, creating an environment that the designer compares to hiding out of sight as a child. Abellanas won't disclose the exact location of the studio for fear that it will be discovered.



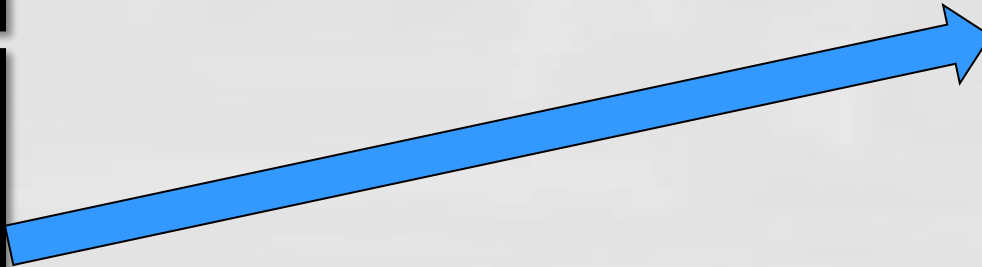
Data Analysis Example

In one frame, two viaducts running parallel are visible, one supported by multiple square-section pillars and the other by a single wall pillar with a mural drawn on it



Data Analysis Example

By zooming into the mural in the same frame, we can identify the "TAG" of the writer who created it. This is worth noting since writers usually divide the areas where they create their paintings and are territorial.



Data Analysis Example

In a second frame you can see the 2 viaducts from another angle.



Data Analysis Example

In a third frame you can see the 2 viaducts from another angle.



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Data Analysis Example

In another frame we see a train passing perpendicularly under the two viaducts.

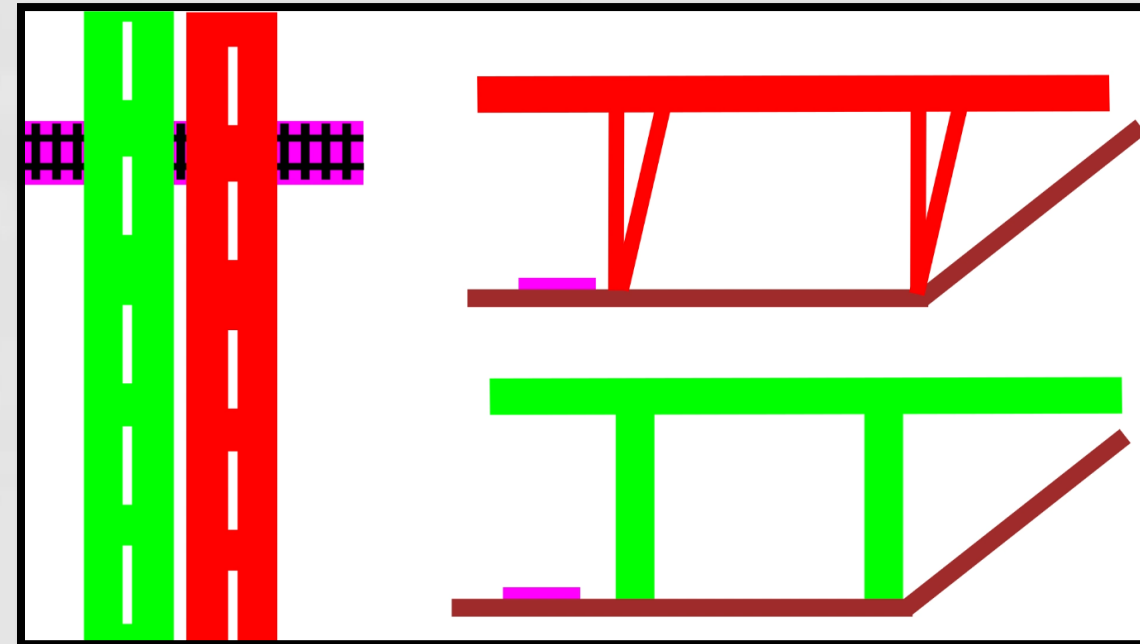


Schematizing Elements

To summarize:

on the map, we need to look for two large roads (bypass or highway) running parallel at a viaduct where there are railway tracks crossing perpendicularly underneath. To get a reference, transcribe this data by drawing the structure from the side and top views.

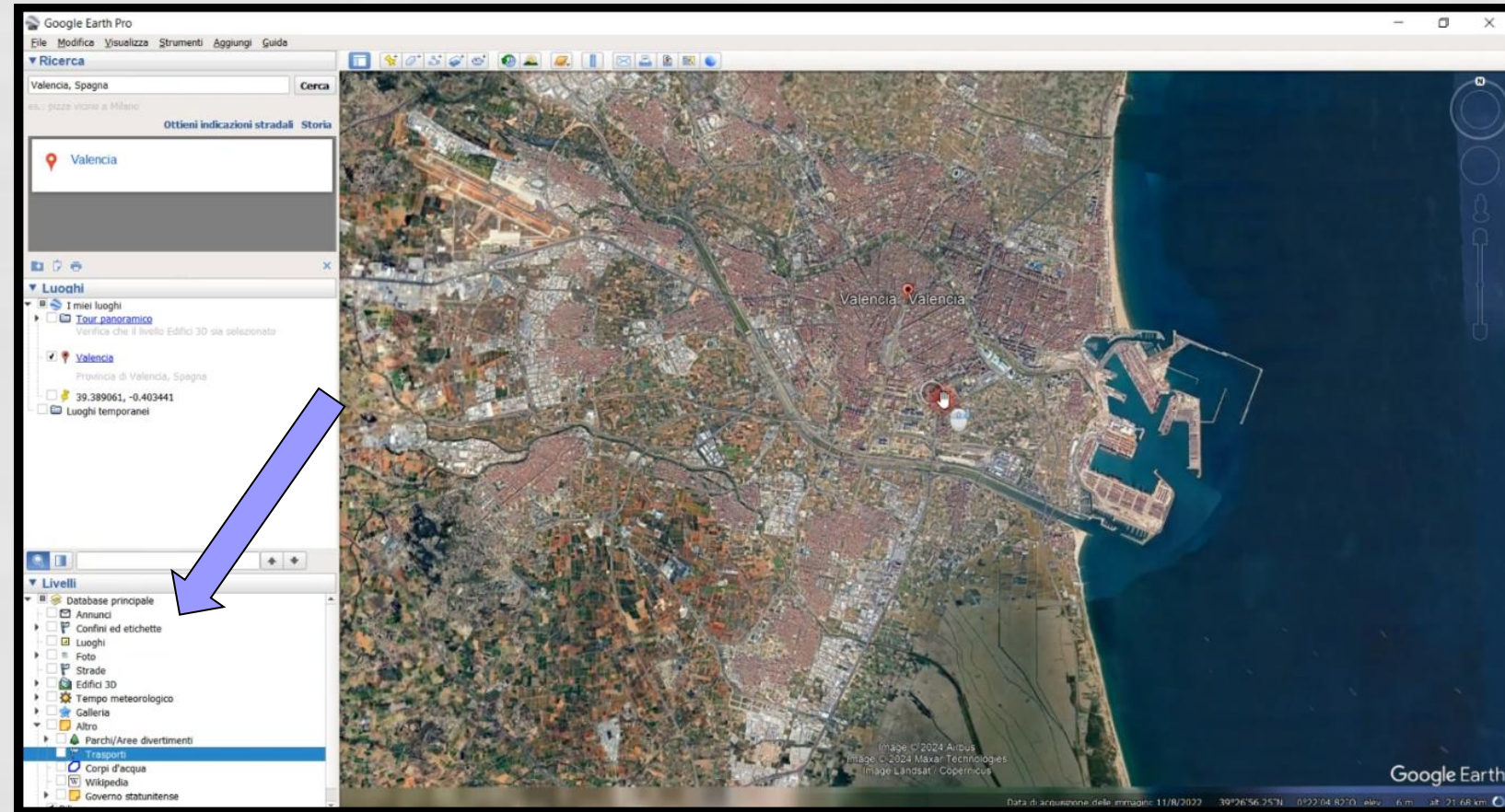
This graphical schematization will be useful for subsequent map searches, especially in places with complex road intersections, urban areas with well-defined structures, gardens, parks, vegetation, parking lots, etc.



Searching for Compatible Targets on the Map²⁶

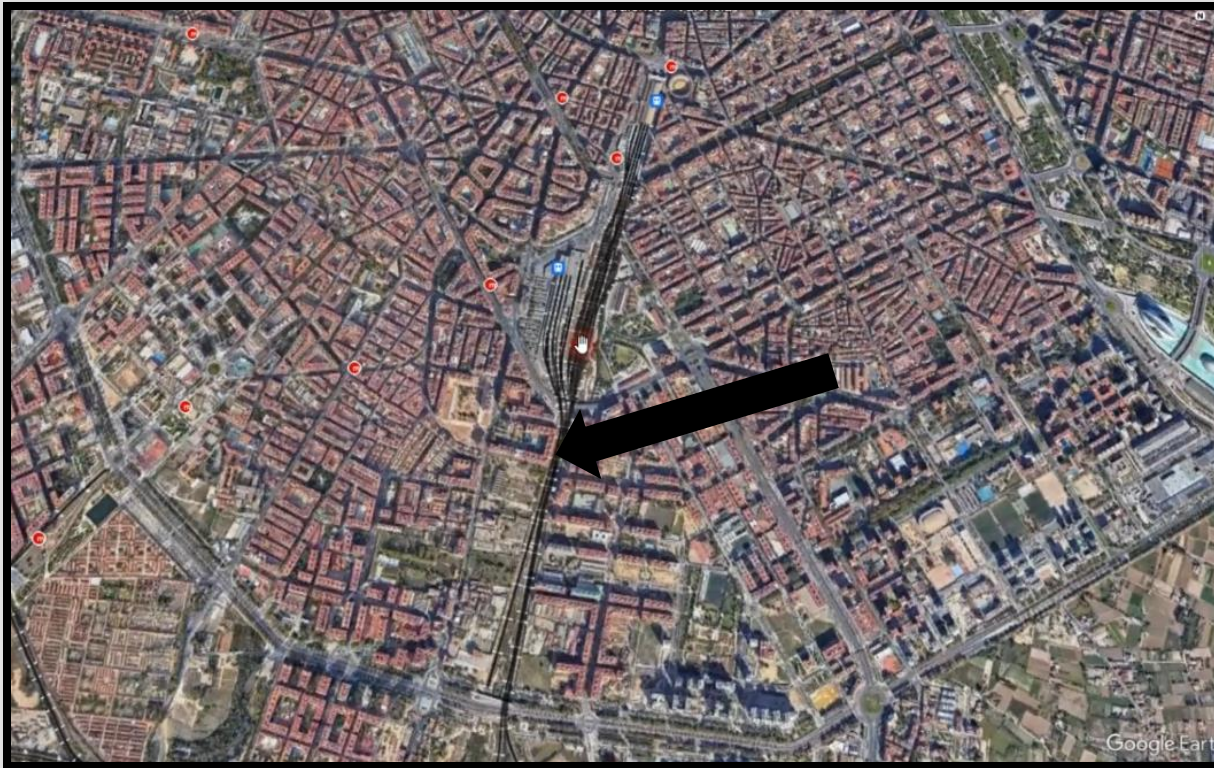
Now, open Google Earth Pro and move to the urban area of Valencia.

Disable all layers in the bottom right panel except for transportation and roads.



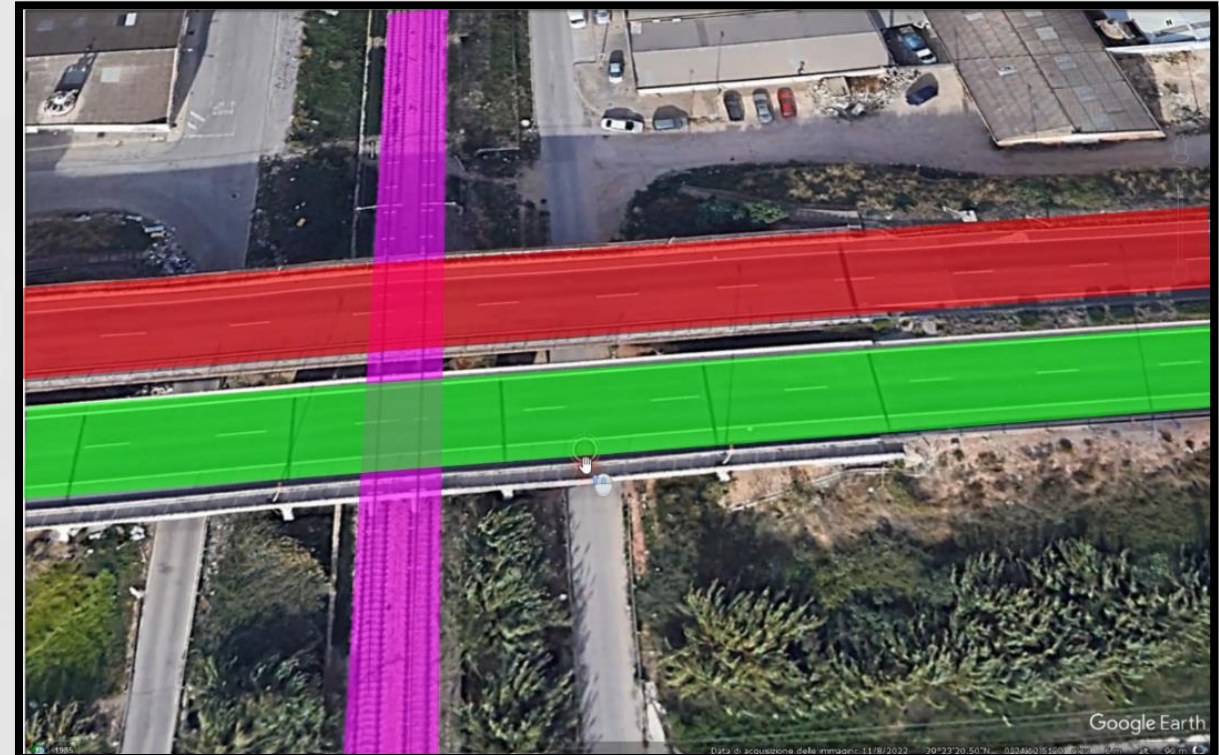
Searching for Compatible Targets on the Map²⁷

On the map, all railway networks (in black) and all road traffic (in yellow) are highlighted.



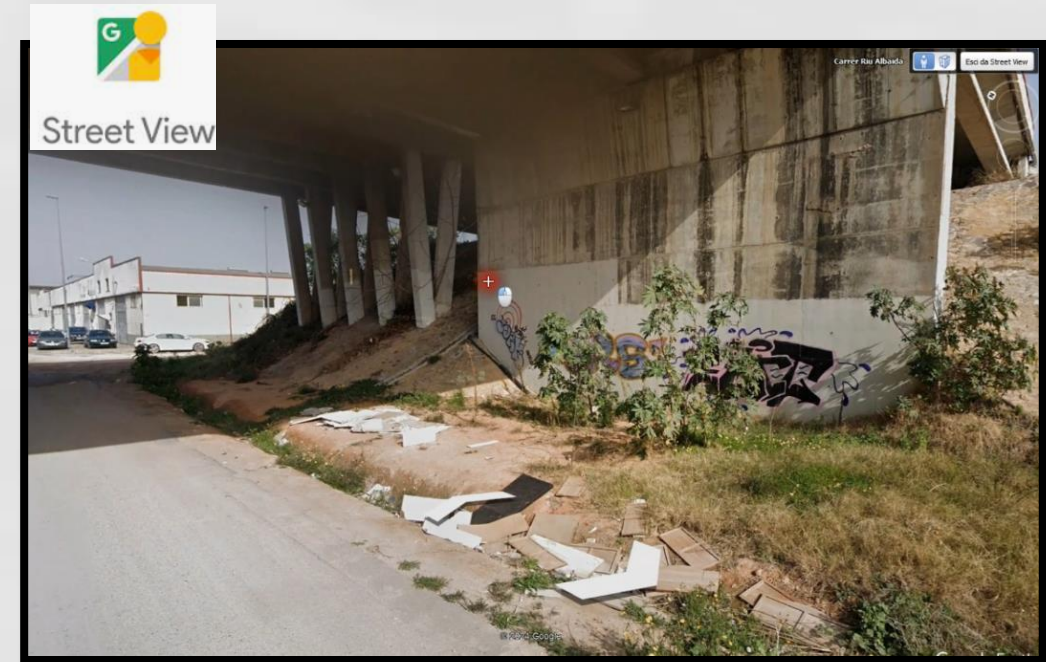
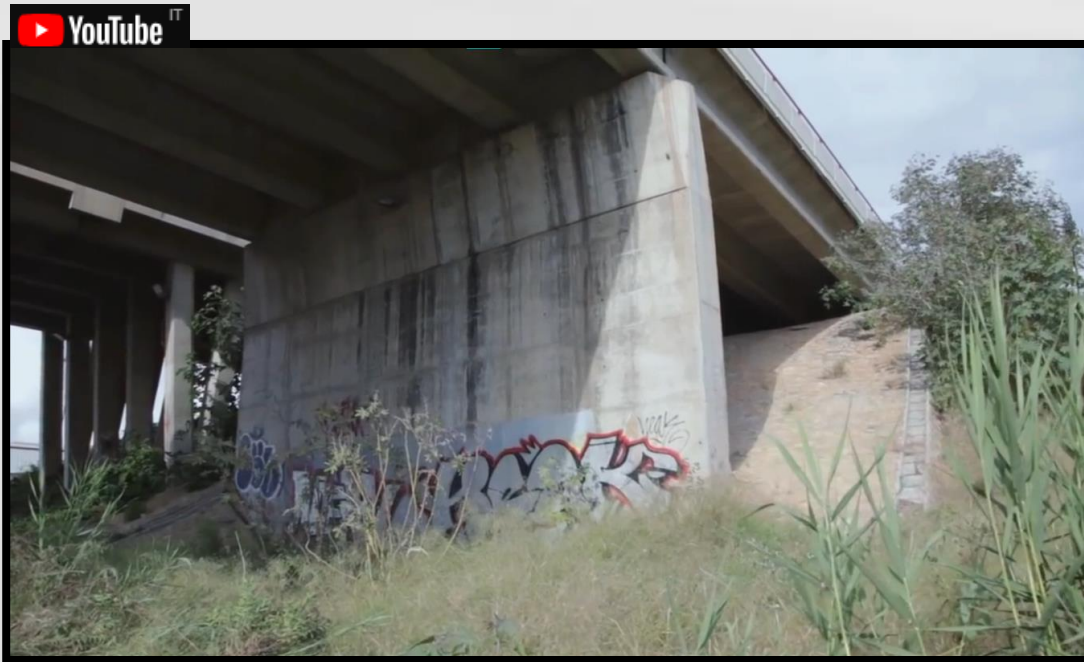
Searching for Compatible Targets on the Map²⁸

Scroll through the territory analyzing all possible targets, looking for intersections between the roads and the railway, with the help of the graphical scheme you previously created. In this case, the location is fully compatible.



Confirming the Target with Additional Elements

Once a potential positive result is found, zoom in until Google Earth Pro switches to street view level. From this perspective, there is full compatibility with the viaduct present on YouTube.



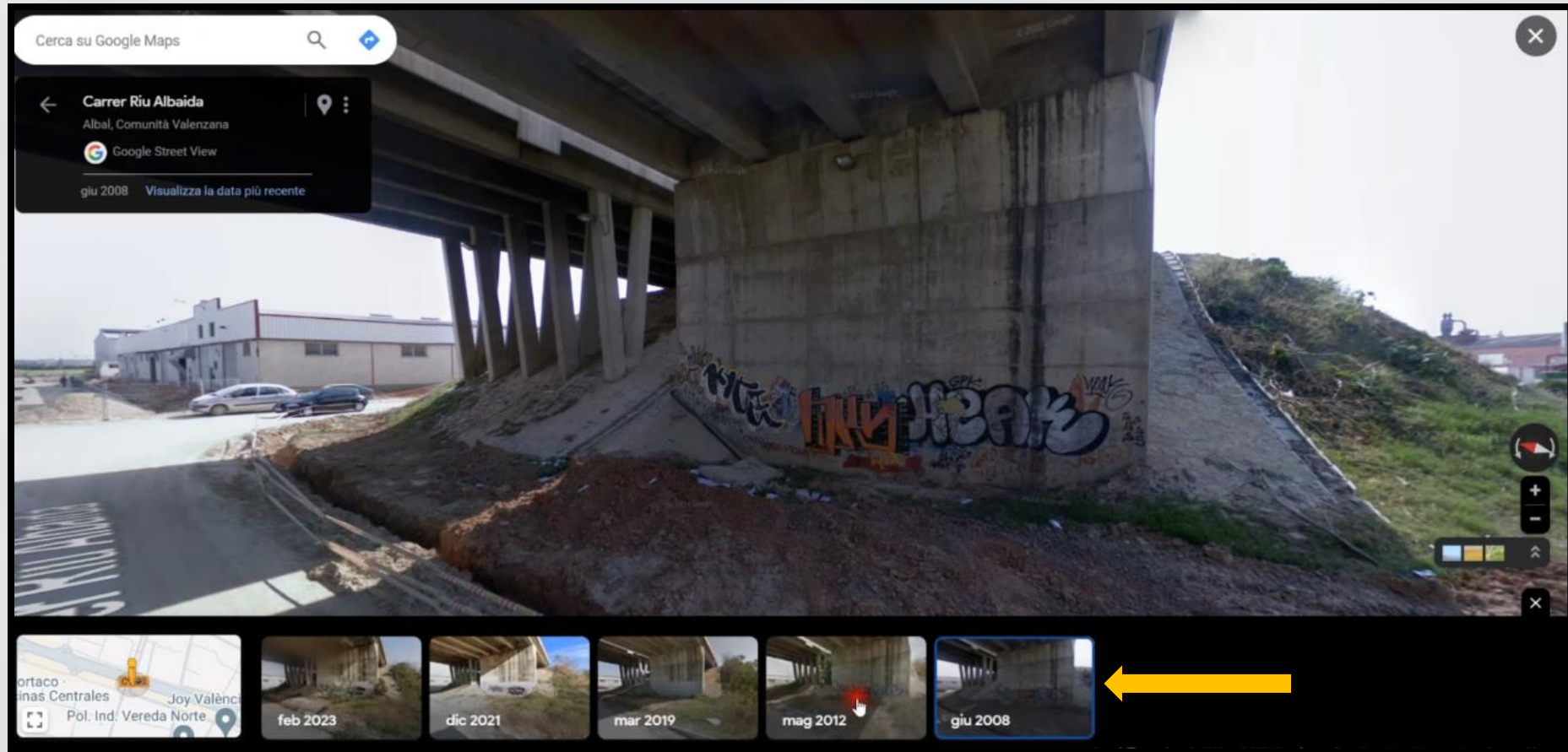
Confirming the Target with Additional Elements

Now open Google Maps and position it on the same location. As you can see, the mural is different from the one in the video. Explore Google's various acquisitions over time to see how the location has changed by clicking on the link indicated by the arrow



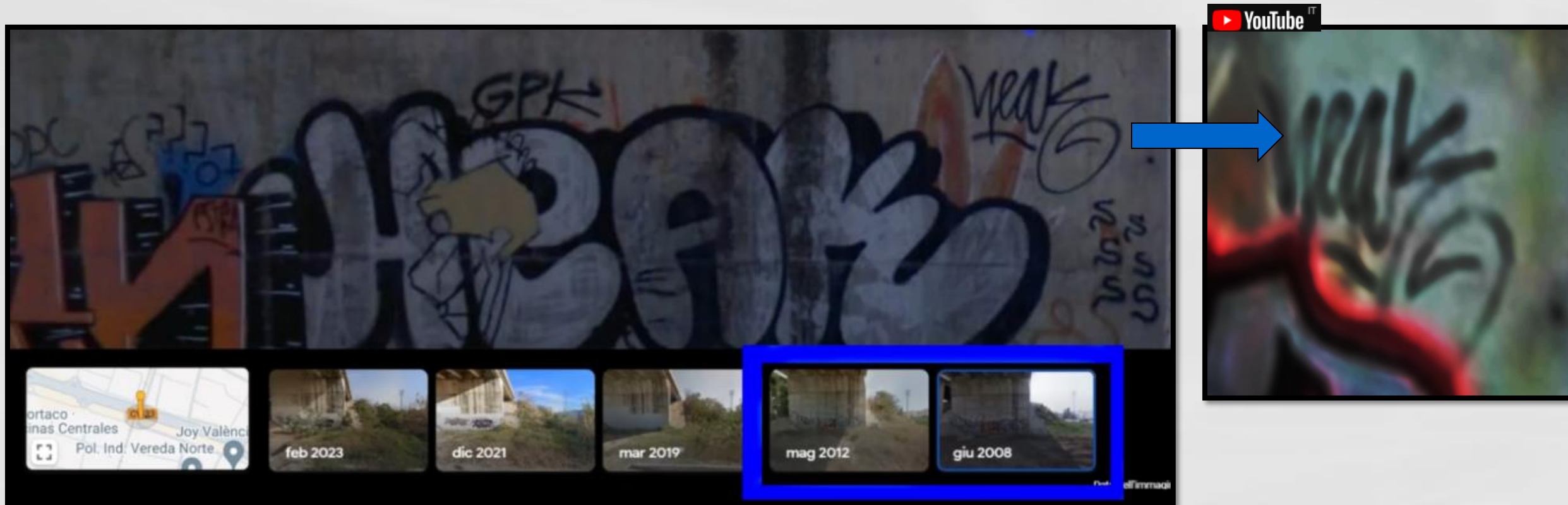
Confirming the Target with Additional Elements

By clicking on the thumbnails below, we can see the state of the places in the corresponding year.



Confirming the Target with Additional Elements

Despite the mural changing over the years, both in 2008 and 2012, we notice the "tag" of the writer in the same position, giving us further confirmation





Useful Tools & Links

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- EXIF Data Analysis– ExifTools <https://exiftool.org/>
- Video to Frames Conversion– VLC <https://www.videolan.org/>
- Image Editor– Gimp <https://www.gimp.org/>
- Google images – <https://www.google.com/imghp>
- Yandex images – <https://yandex.com/images/>
- Google maps – <https://google.com/maps/>
- Maps – Google Earth Pro https://www.google.com/intl/it_ALL/earth/about/versions/#earth-pro
- Maps ESRI Wayback – <https://livingatlas.arcgis.com/wayback>
- Multi maps – <https://satellites.pro/>
- Youtube Downloader – https://www.freemake.com/it/free_video_downloader_perfect/

