Digital Forensics Lab Report: 3

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Name:	**Parth Patel**
Roll No:	**19BCP091**
Subject Code:	**20CP411P**
Subject Name:	**Digital Forensics Lab**

Aim/Purpose: Study of a Identification of Morphed/Edited/Fabricated portion from given Video/Audio/Image files as investigation input

Tool Names:

1. **Forensically :-** Forensically, free online photo forensics tools - 29a.ch
2. **YouTube meta data:-** YouTube Metadata (mattw.io)
3. **Wikimapia:-** **https://www.google.com/search?q=wikimapia&rlz=1C1ZKTG_enIN914IN919&oq=Wikimapia&aqs=chrome.0.0i131i433i512j0i512l9.20776j0j4&sourceid=chrome&ie=UTF-8**
4. **Pic2map :-** Photo Location & Online EXIF Data Viewer - Pic 2 Map
5. **Suncalc :-** SunCalc - sunrise, sunset, shadow length, solar eclipse, sun position, sun phase, sun height, sun calculator, sun movement, map, sunlight phases, elevation, Photovoltaic system, Photovoltaic
6. **Exif Data Viewer :-** EXIF Data Viewer
7. **Exif Tool:**

Task 1:- Use photo forensics tool :- Forensically

- Forensically:- Forensically, free online photo forensics tools - 29a.ch
- Forensically is a set of free tools for digital image forensics. It includes clone detection, error level analysis, meta data extraction and more. It is made by Jonas Wagner.
- It provide Tools like Magnifier, Magnification factor, Clone Detection, Enhancement, Error Level Analysis. Noise Analysis, Level Sweep, Luminance Gradient, JPEG Analysis

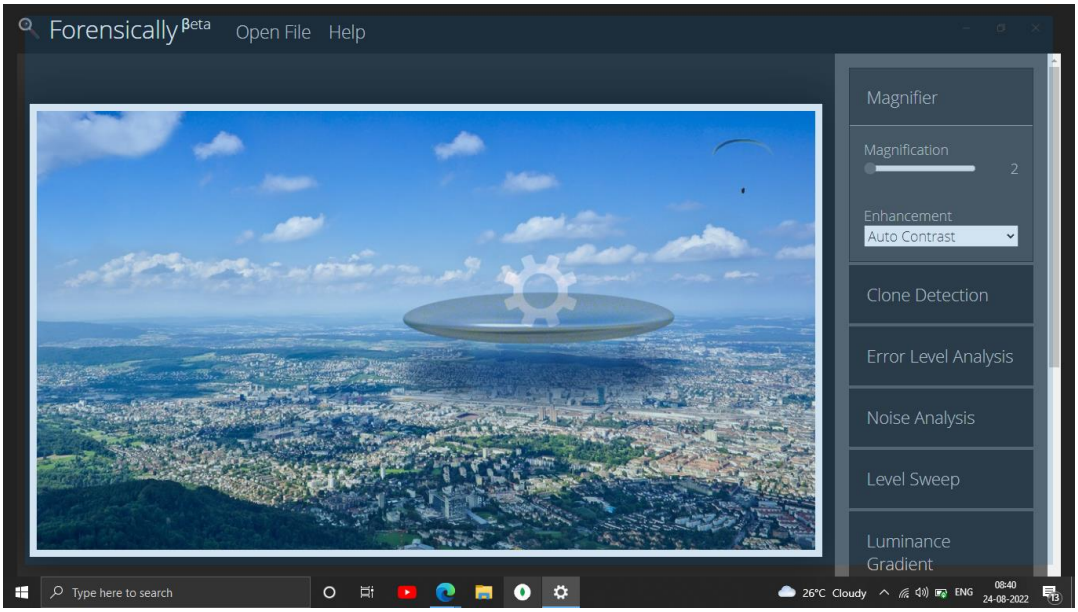

Figure 1 photo forensics tool :- Forensically

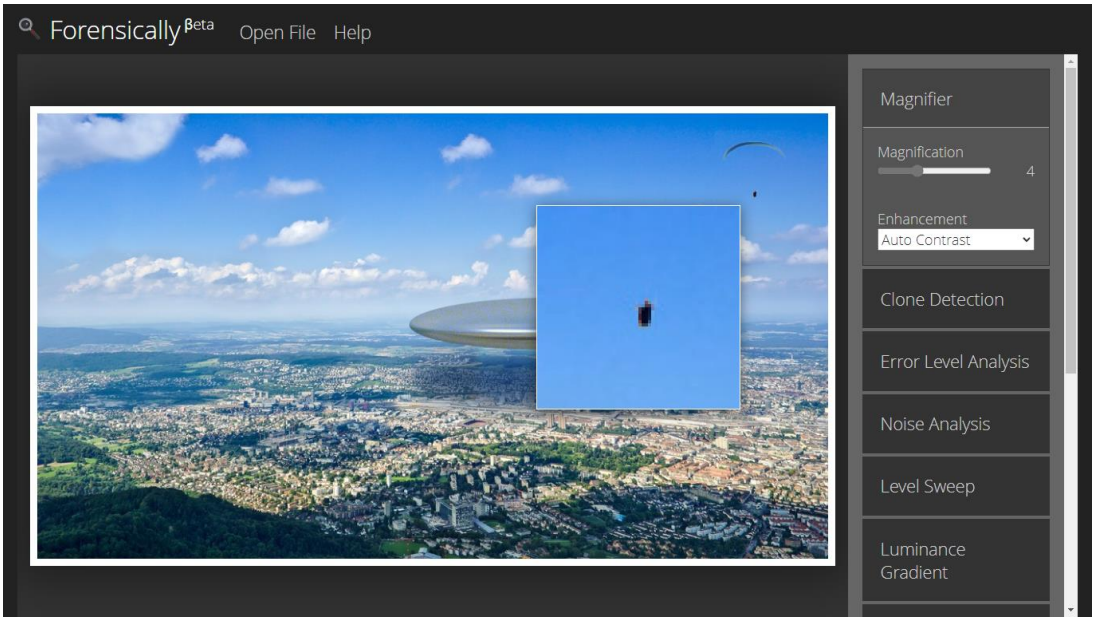

Figure 2 photo forensics tool :- Forensically

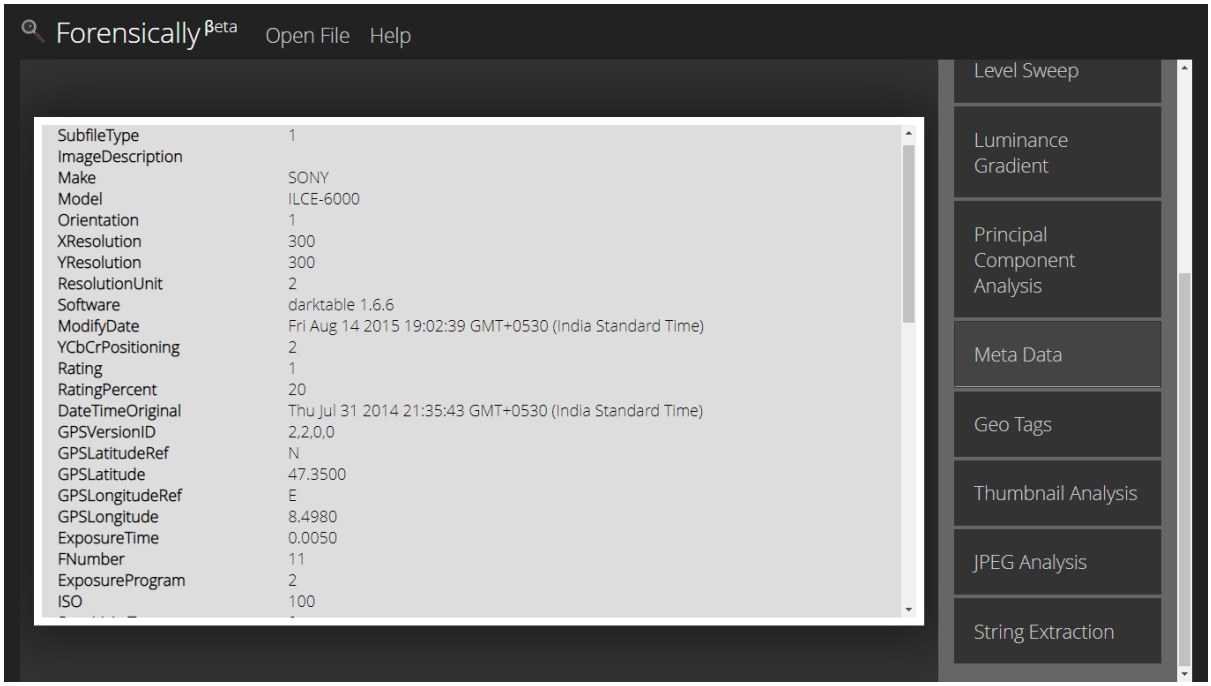

Figure 3 photo forensics tool :- Forensically

Analysis:

1. We are using forensics for digital image forensics and this tool includes clone detection, error level analysis, meta data extraction.
2. It also provided function like Enhancement, Error Level Analysis. Noise Analysis, Level Sweep, Luminance Gradient, JPEG Analysis

Task 2:- Exploring YouTube meta data tool

- YouTube meta data:- YouTube Metadata (mattw.io)
- The Youtube Dataviewer is a tool that allows users to extract metadata from Youtube videos.
- YouTube metadata is information that is used to describe each video uploaded to the platform. Basic examples include things like title, channel name and date uploaded. More sophisticated YouTube metadata includes things such as geographic coordinates, camera make and frame rate.

Steps

1. **Open** YouTube meta data:- YouTube Metadata (mattw.io)

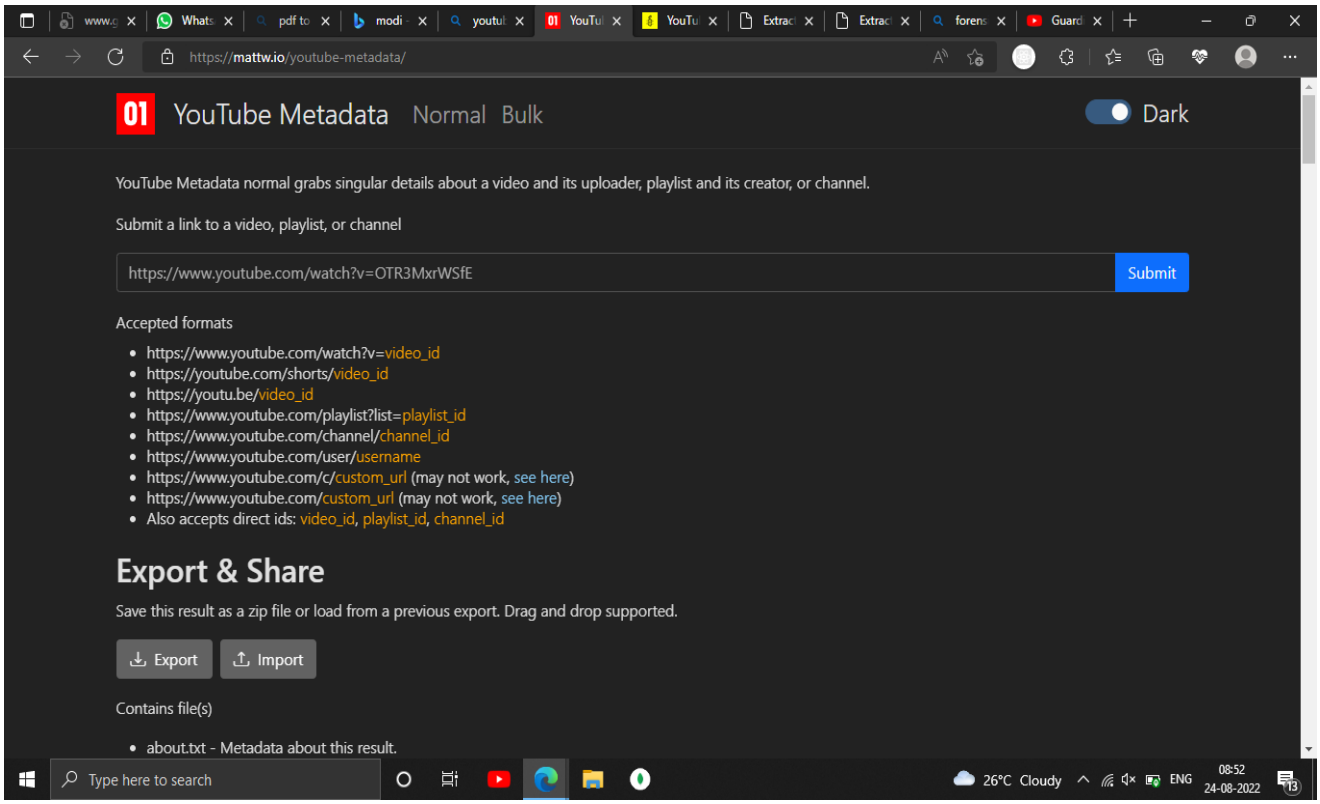

Figure 4 YouTube meta data tool

2. On YouTube meta data website upload You Tube video link and press search Butten and you will get all information related to that video.

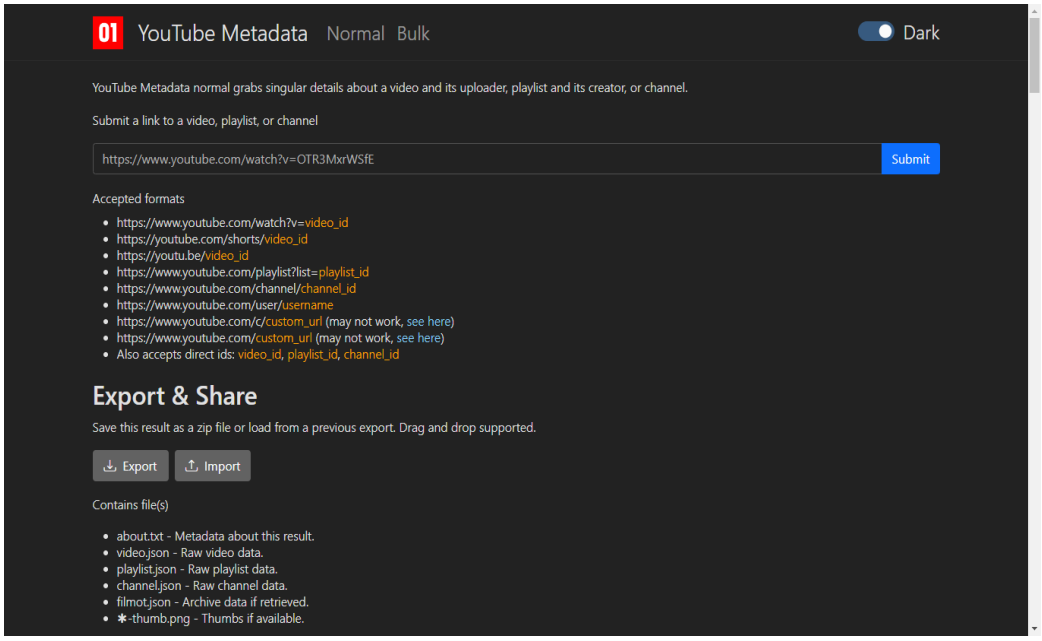

Figure 5 YouTube meta data tool

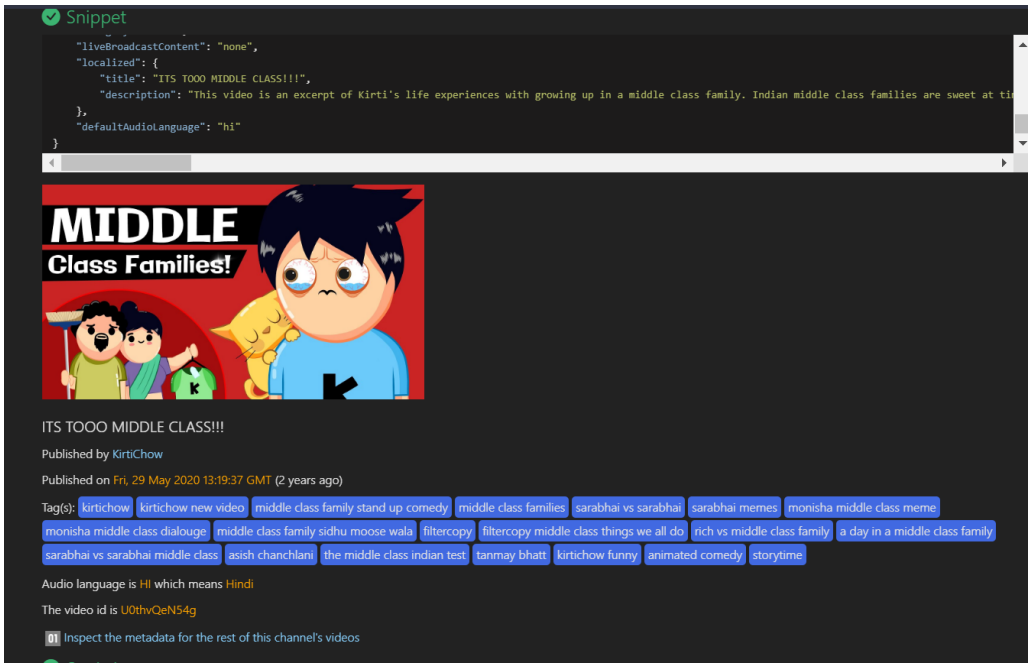

Figure 6 YouTube meta data tool

Analysis:

1. YouTube metadata provided information that is used to describe each video uploaded to the platform.
2. Which include things like title, channel name and date uploaded. More sophisticated YouTube metadata includes things such as geographic coordinates, camera make and frame rate.

Task 3:- Exploring Wikimapia

- **Wikimapia:**https://www.google.com/search?q=wikimapia&rlz=1C1ZKTG_enIN914IN919&oq=Wikimapia&aqs=chrome.0.0i131i433i512j0i512l9.20776j0j4&sourceid=chrome&ie=UTF-8
- **Wikimapia** is a geographic online encyclopedia project. The project implements an interactive "clickable" web map that utilizes Google Maps with a geographically-referenced wiki system, with the aim to mark and describe all geographical objects in the world.
- Wikimapia was created by Alexandre Koriakine and Evgeniy Saveliev in May 2006. Wikimapia is an open-content collaborative mapping project, aimed at marking all geographical objects in the world and providing a useful description of them.[7] It aims to create and maintain a free, complete, multilingual and up-to-date map of the whole world. Wikimapia intends to contain detailed information about every place on Earth.

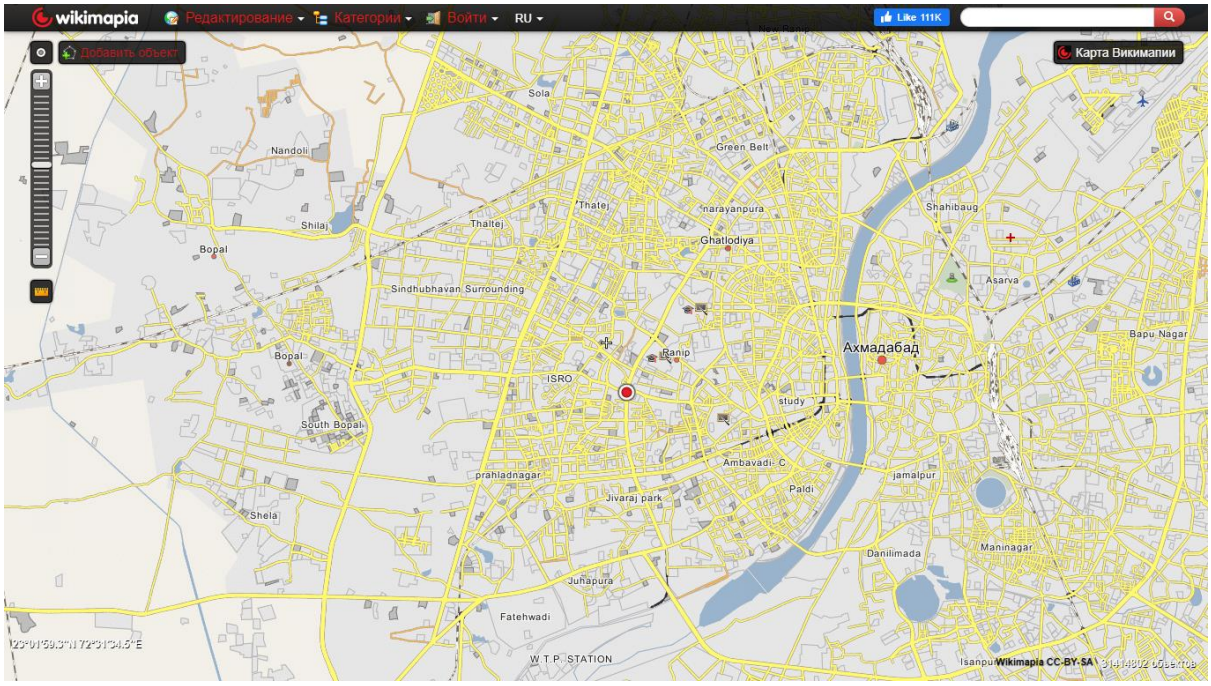

Figure 7 Wikimapia

Analysis:

1. We are creating all geographical objects in the world and providing a useful description of them and also creating and maintain a free, complete, multilingual and up-to-date map of the whole world.

Task 4 :- Exploring Photo Location & Online EXIF Data Viewer tool:- Pic2map

- **Pic2map :-** Photo Location & Online EXIF Data Viewer - Pic 2 Map
- Pic2Map is an online EXIF data viewer with GPS support which allows you to locate and view your photos on a map. Our system utilizes EXIF data which is available in almost all photos taken with digital cameras, smartphones and tablets.
- Even without GPS data, Pic2Map still serves as a simple and elegant online "EXIF" data viewer; which is short for Exchangeable Image File, a format that is a standard for storing interchange information in digital photography image files using JPEG compression.
- Depending on the brand and model of the camera; EXIF data includes information such as; shutter speed, exposure compensation, F number, ISO speed, flash usage, date and time the image was taken, whitebalance, auxiliary lenses that were used and resolution. Below, you can find a more detailed listing of all data Pic2Map provides

Steps:-

1. **Visit Pic2map :-** Photo Location & Online EXIF Data Viewer - Pic 2 Map

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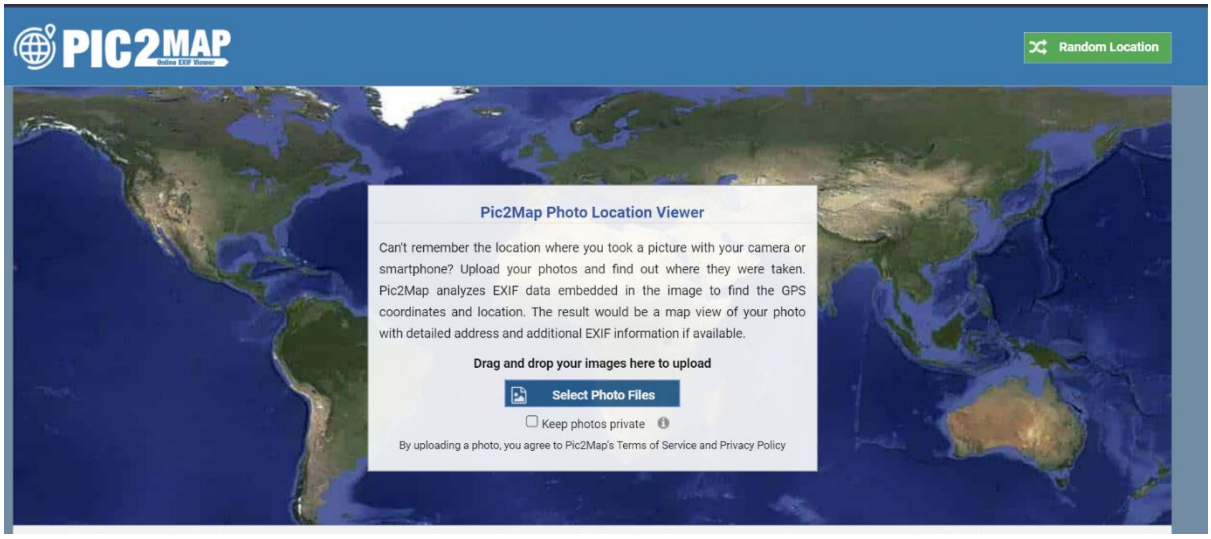

Figure 8 Photo Location & Online EXIF Data Viewer tool:- Pic2map

2. **Upload photo in the website and you will get location of that photo**

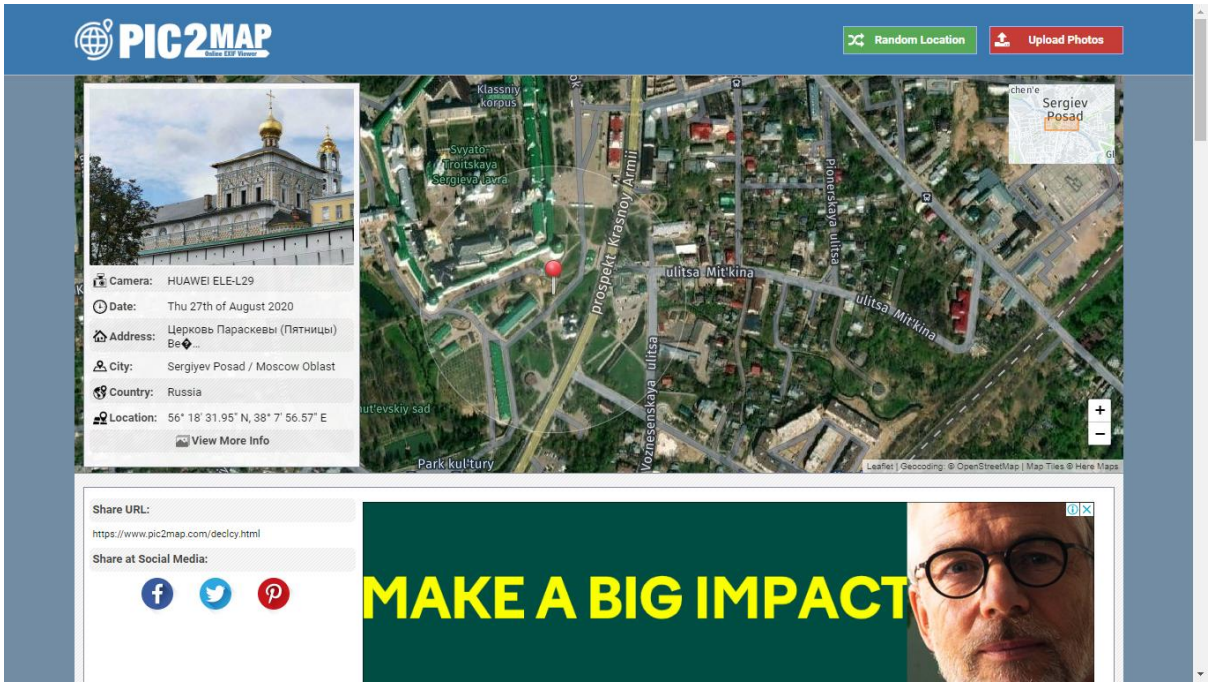

Figure 9 Photo Location & Online EXIF Data Viewer tool:- Pic2map

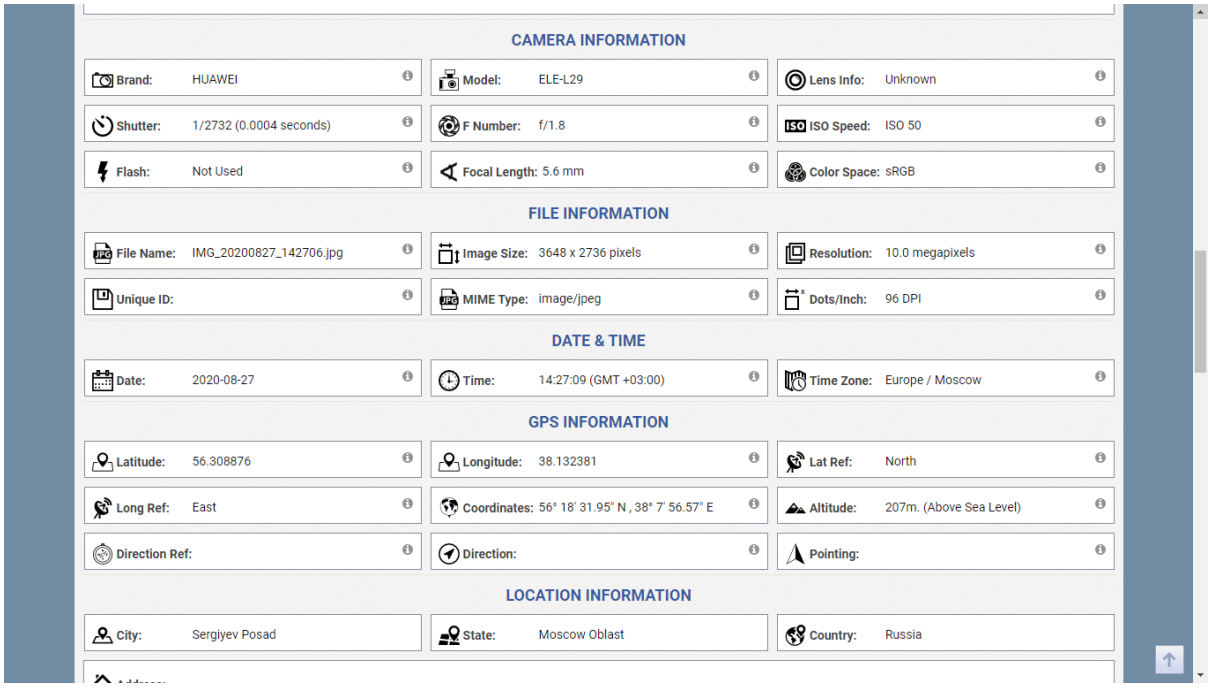

Figure 10 Photo Location & Online EXIF Data Viewer tool:- Pic2map

Analysis:

1. We are using Pic2map for computing locating and orientating of a picture of #D found control point
2. It also uses for the interaction between the map and the picture through a Digital Elevation Model

Task 5:- Exploring Suncalc

- Suncalc :- SunCalc - sunrise, sunset, shadow length, solar eclipse, sun position, sun phase, sun height, sun calculator, sun movement, map, sunlight phases, elevation, Photovoltaic system, Photovoltaic

- SunCalc is a little app that shows sun movement and sunlight phases during the given day at the given location. The user can see sun positions at sunrise, specified time and sunset. The thin orange curve is the current sun trajectory, and the yellow area around is the variation of sun trajectories during the year.

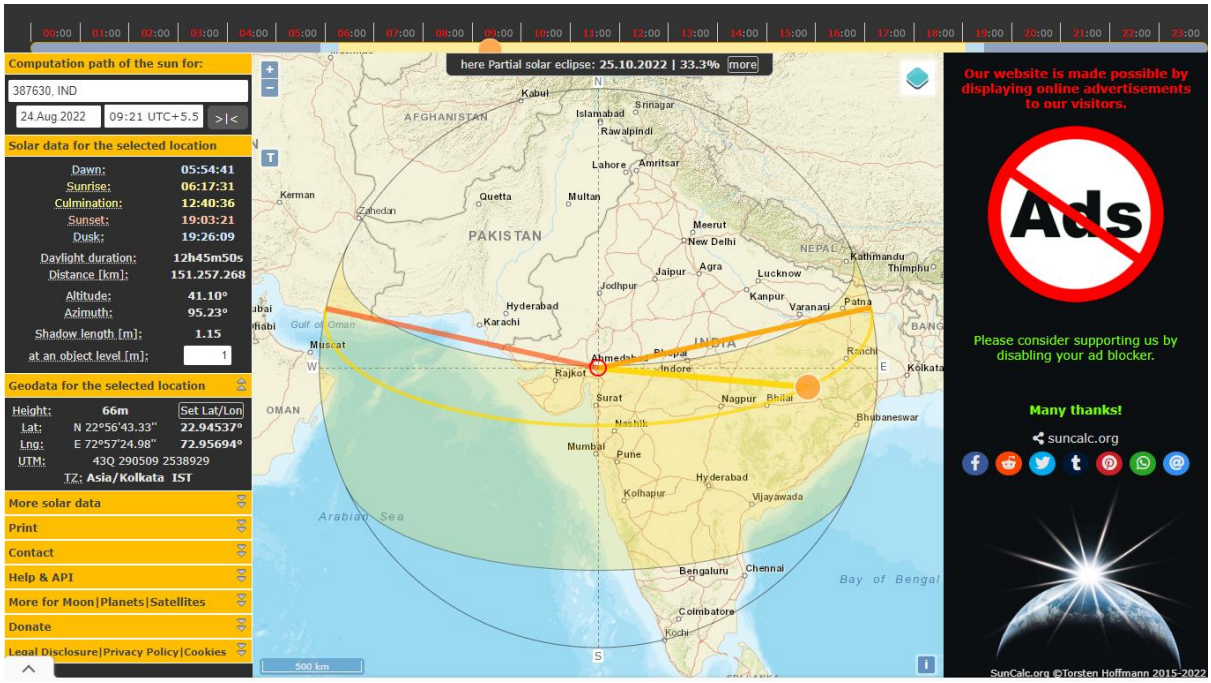

Figure 11 Suncalc

Analysis:

3. We are using SunCal to measures the amount of accumulated sunlight that falls on a specific garden location.

Task 6:- Exploring Exif Data Viewer

- **Exif Data Viewer :-** EXIF Data Viewer
- EXIF is short for Exchangeable Image File, a format that is a standard for storing interchange information in digital photography image files using JPEG compression.
- Almost all new digital cameras use the EXIF annotation, storing information on the image such as shutter speed, exposure compensation, F number, what metering system was used, flash, ISO number, date and time the image was taken, whitebalance, auxiliary lenses that were used and resolution.

Step 1: visit website Exif Data Viewer **:-** EXIF Data Viewer And upload image and you will get all data related to that image.

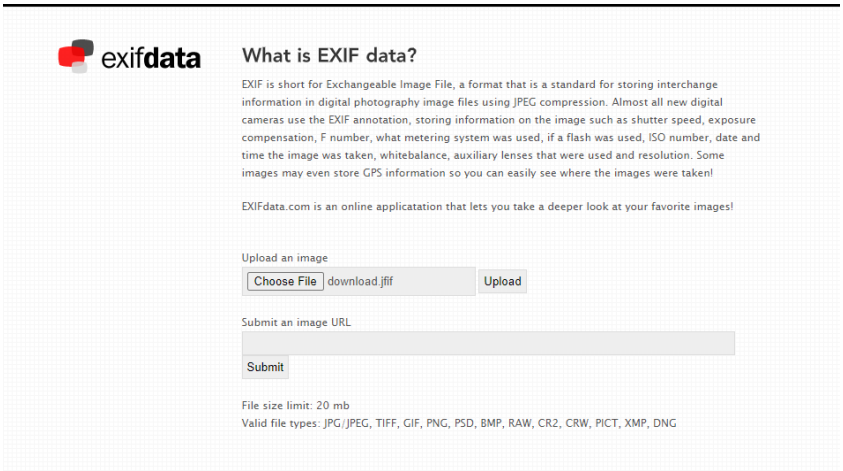

Figure 12 Exif Data Viewer

Figure 13 Exif Data Viewer

Analysis:

- We are using Exif Data viewer for Exchangeable Image File, a format that is a standard for storing interchange information in digital photography image files using JPEG compression.

Task 7:- Exploring Exif tool

- Exif Tool is a free and open-source software program for reading, writing, and manipulating image, audio, video, and PDF metadata. It is platform independent, available as both a Perl library (Image::ExifTool) and command-line application. Exif Tool is commonly incorporated into different types of digital workflows and supports many types of metadata including Exif, IPTC, XMP, JFIF, GeoTIFF, ICC Profile, Photoshop IRB, FlashPix, AFCP and ID3, as well as the manufacturer-specific metadata formats of many digital cameras.

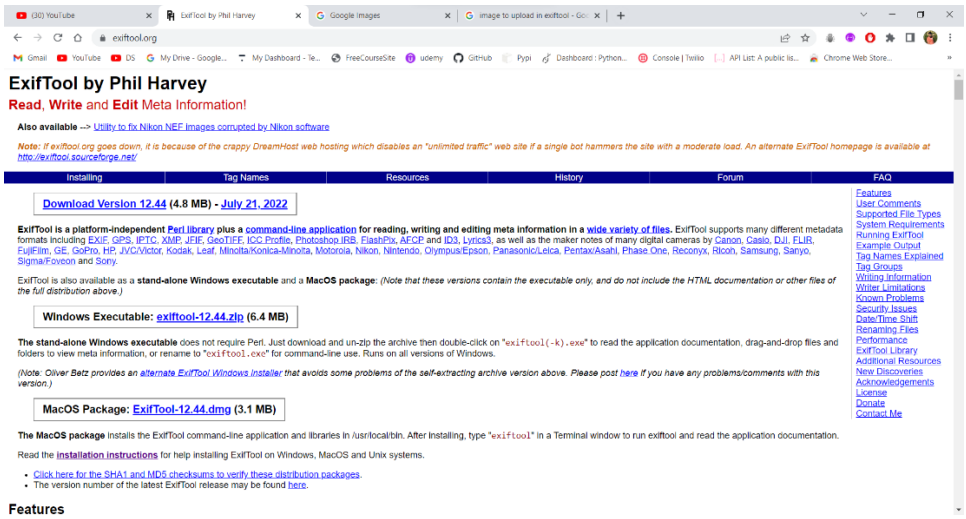

Figure 14 Exif tool

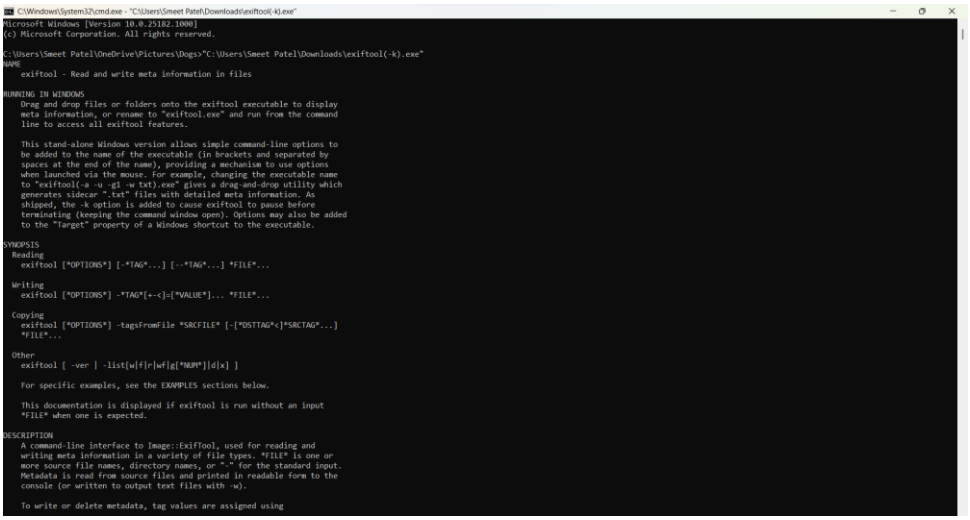

Figure 15 Exif tool

Analysis:

- We are using Exif Data Viewer for reading, writing, and manipulating image, audio, video, and PDF metadata

Identifying original and edited photo using forensically

1. **Magnification:** If we zoom the morphed image we can say that flowers are added in image.

Original:

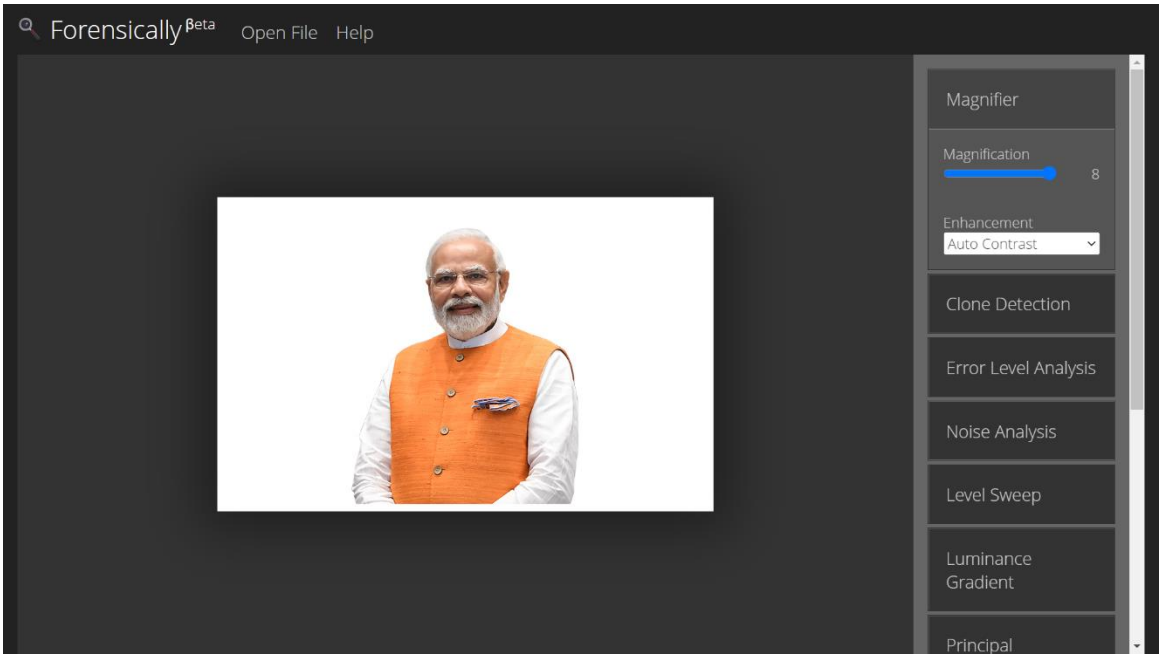

Figure 16 original image

Morphed:

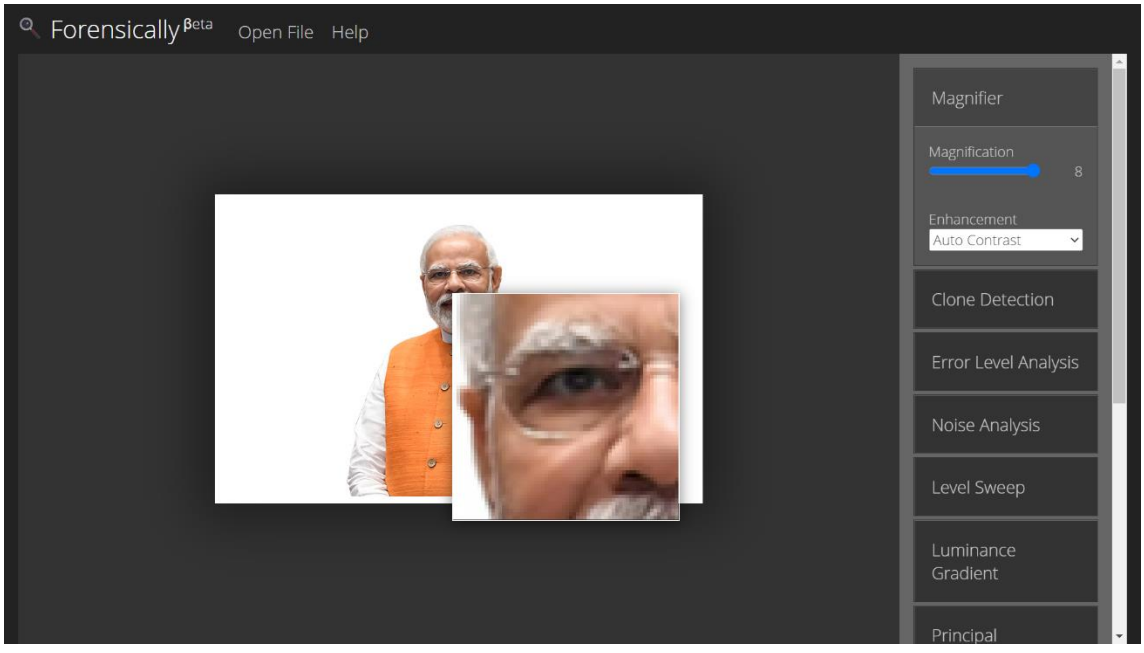

Figure 17 Morphed image

2. **Error Level Analysis:** if we set parameters of ELA same for both original and morphed photo you can easily classify the morphed photo.

Original:

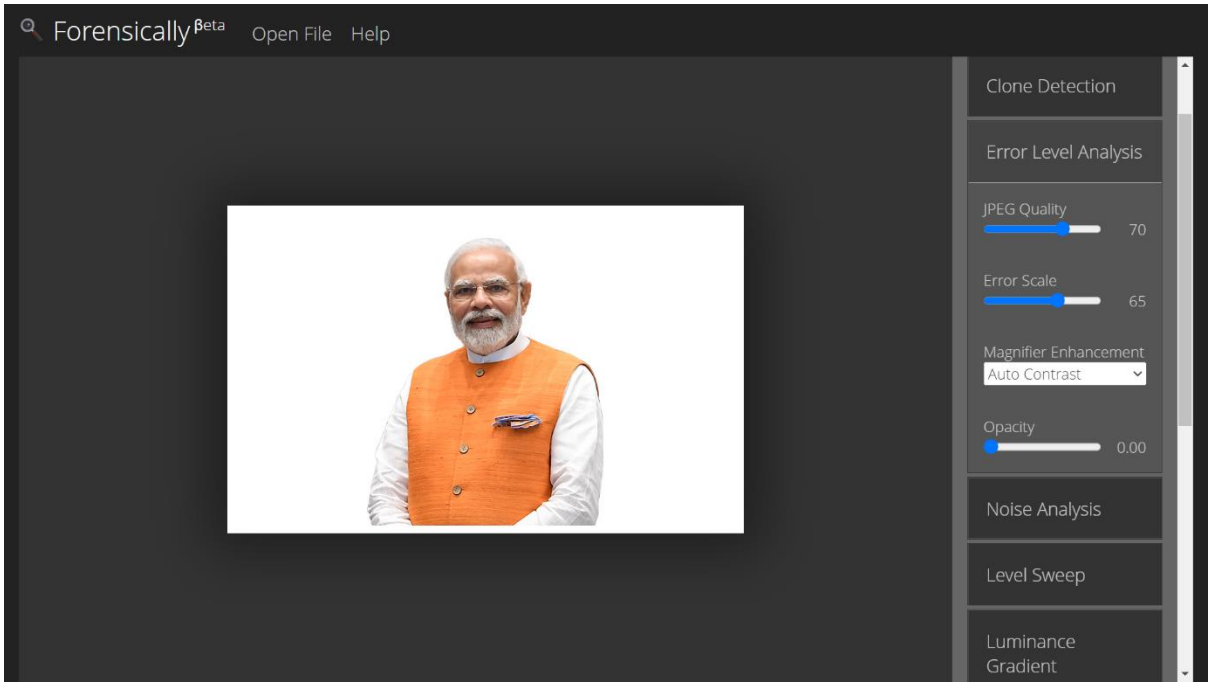

Figure 18 original image

Morphed:

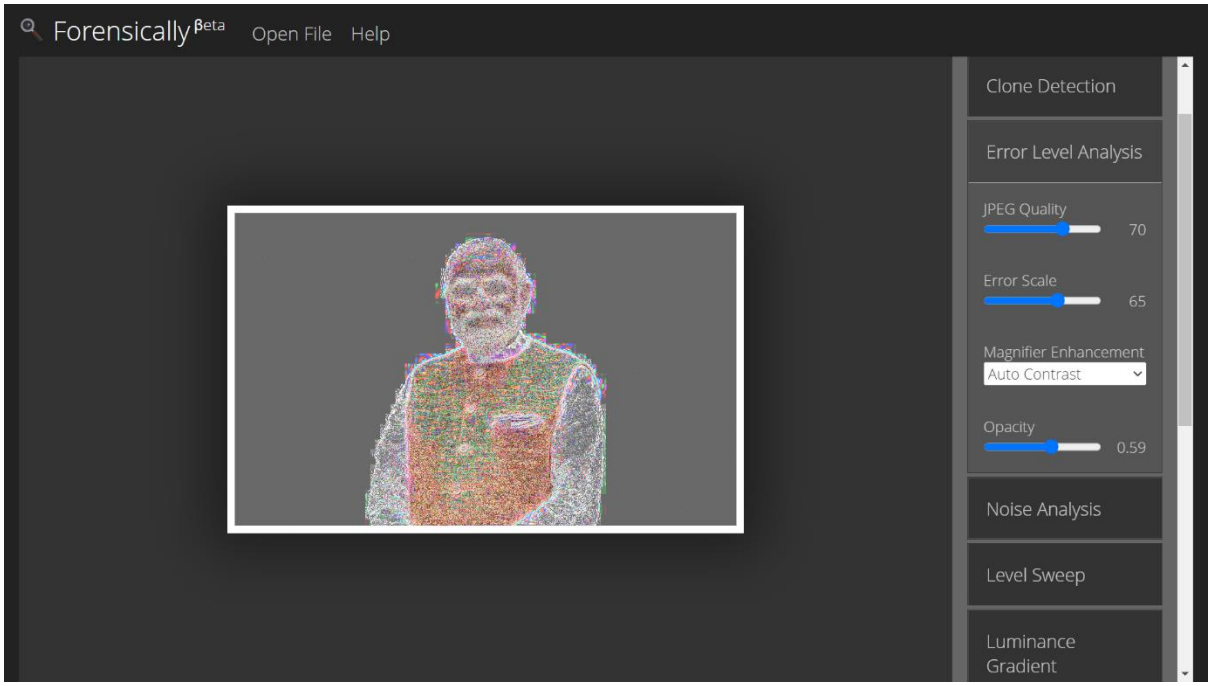

Figure 19 Morphed image

3. Noise Analysis: It is not that much helpful.

Original:

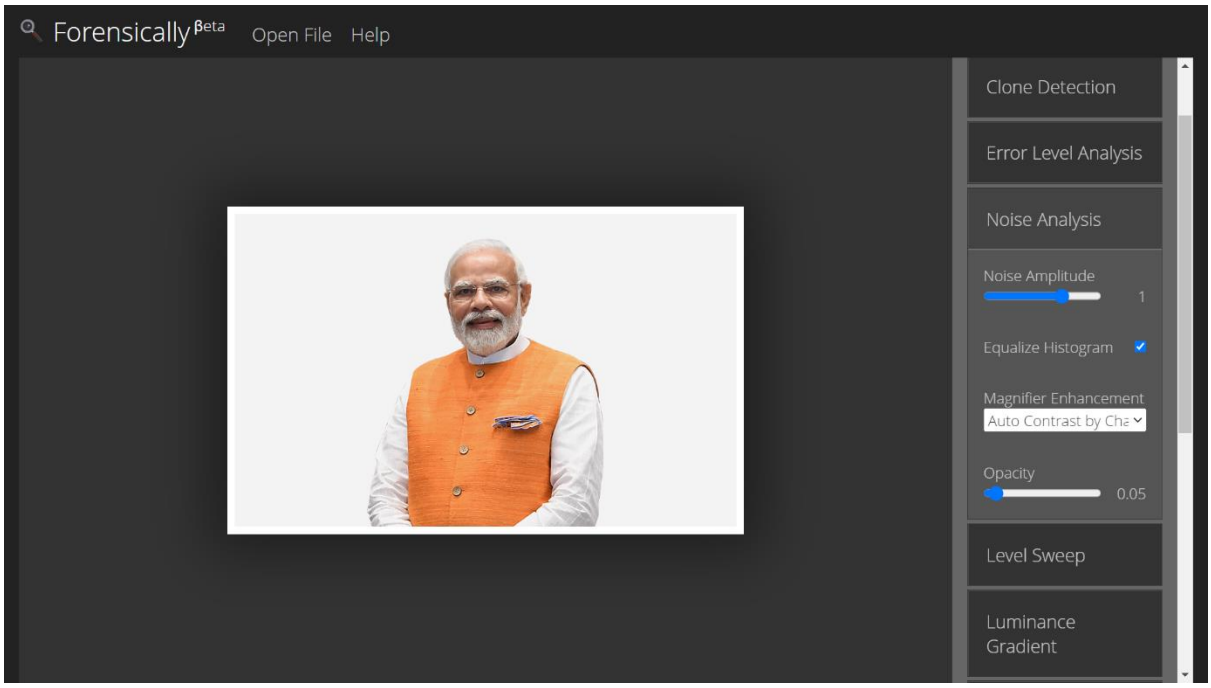

Figure 20 original image

Morphed:

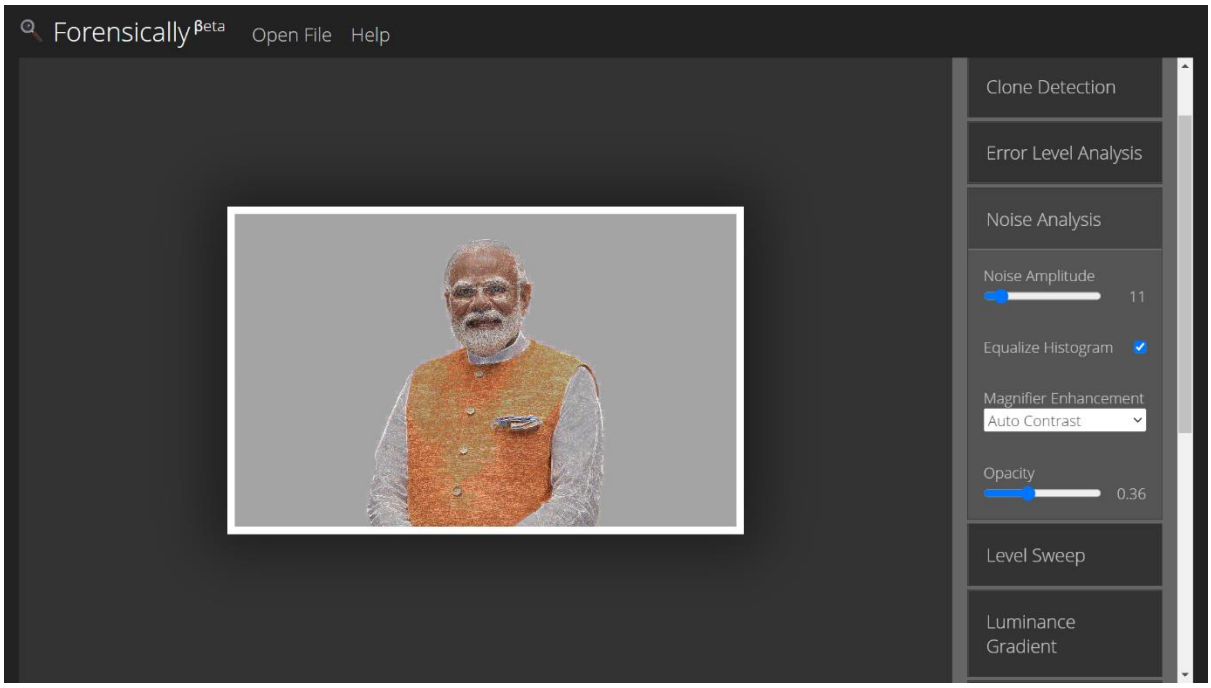

Figure 21 Morphed image

4.Meta Data: In original photo software is iOS 15.5 and in morphed photo software is Instagram.

Original:

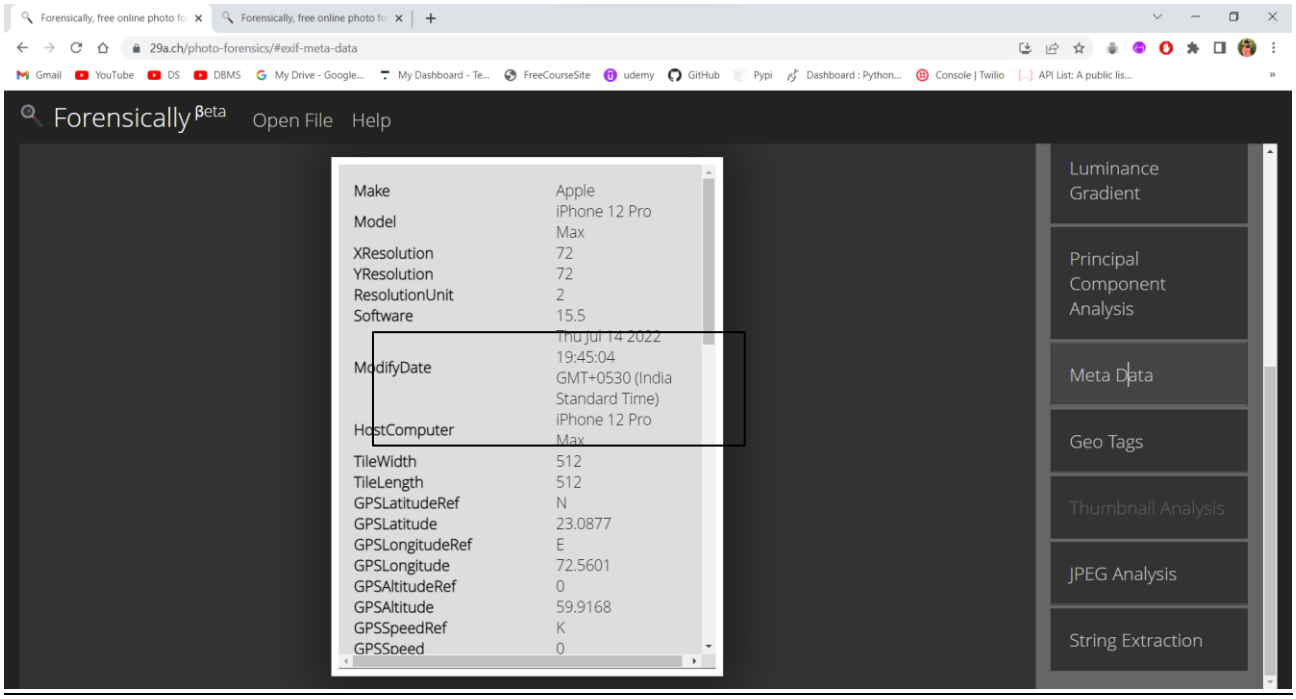

Figure 22 original image

Morphed:

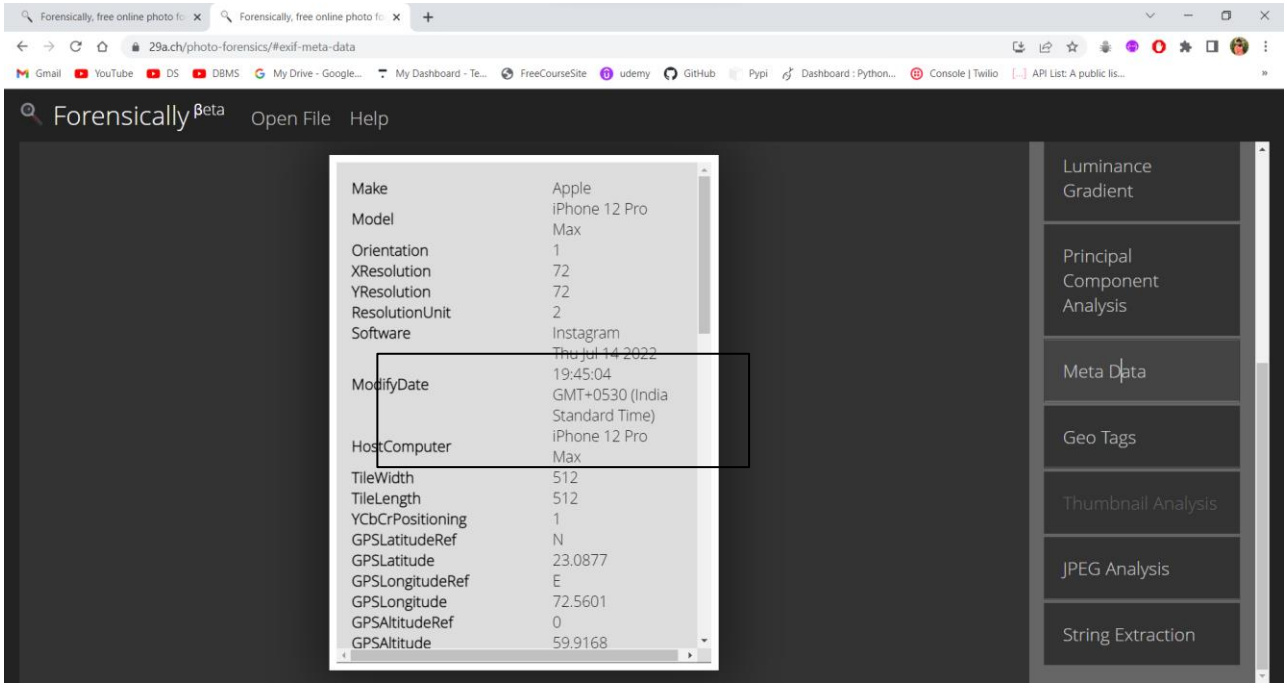

Figure 23 Morphed image

5. Geo Tags: I edited the photo from same location so details is same for both, but if some else has edited than the location maybe deferent.

Original:

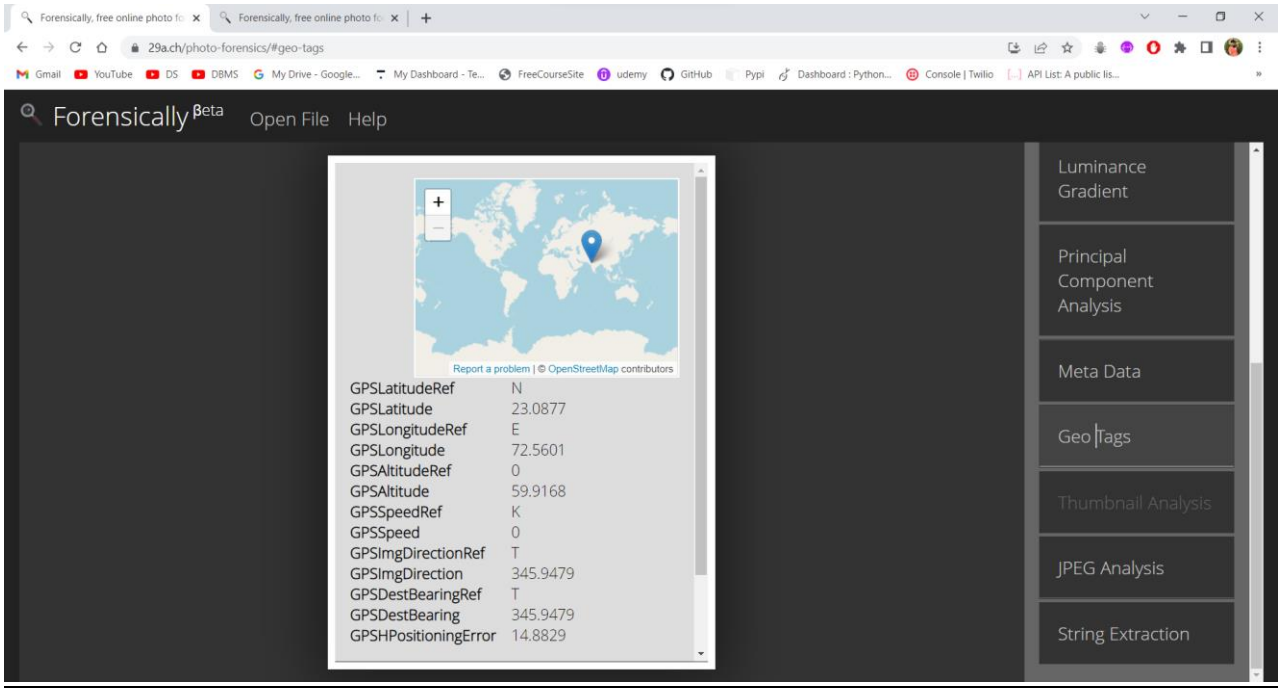

Figure 24 original image

Morphed:

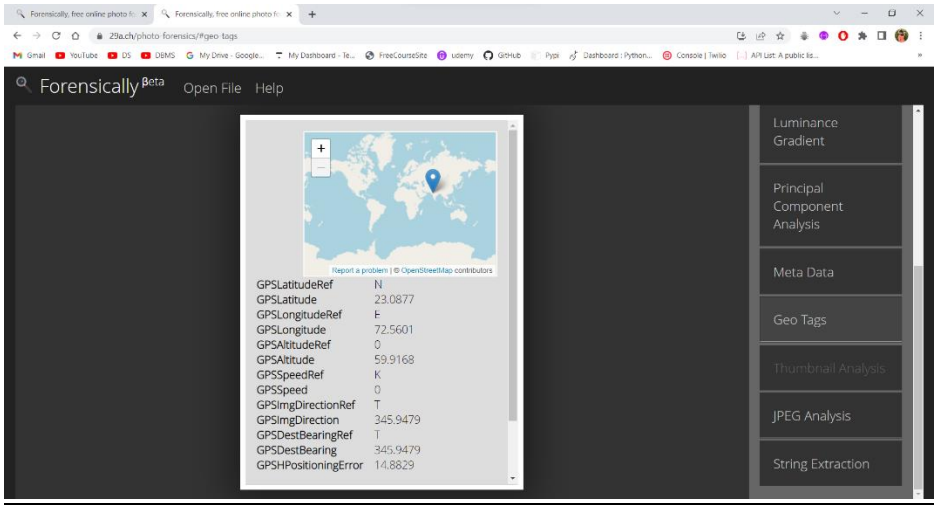

Figure 25 Morphed image

6. String Extraction:

Original:

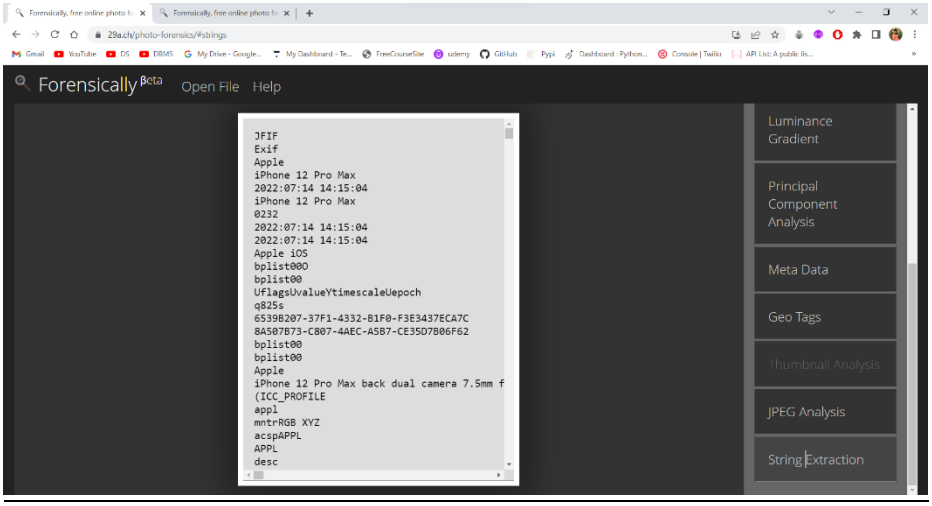

Figure 26 original image

Morphed:

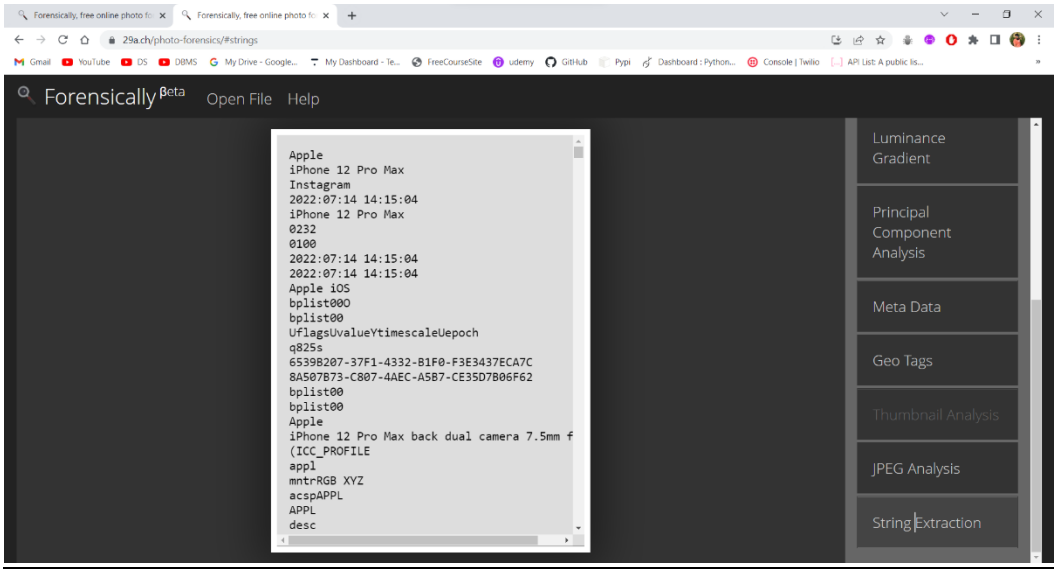

Figure 27 Morphed image

Conclusion:

1. We are using tool like forensically to Identifying original and edited photo.We are using YouTube metadata, Exif Data Viewer, Exif tool to find details or information related video or images. we are also using other like Suncalc and Pic2map