SunCalc Report
Cyber Intel | SunCalc | 22/09/2023

Executive Summary

This report provides an overview of SunCalc, a versatile tool designed to provide critical information about the position of the sun at any given time and location on Earth. SunCalc is an essential tool for a wide range of applications, including outdoor activities, photography, solar energy generation, and more. This report covers various aspects of SunCalc, including its features, installation process, execution, and scope.

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1. Introduction

Suncalc is an OSINT tool that allows analysts to calculate and visualize the position of the sun at any given time and location. By leveraging astronomical algorithms and geolocation data, Suncalc provides detailed information about sunrise, sunset, twilight phases, solar azimuth, and solar elevation. This tool proves invaluable in a

range of fields, including forensic investigations, surveillance operations, photography, and outdoor activity planning.

2. Tool Details

GitHub Link: mourner/suncalc: A tiny JavaScript library for calculating sun/moon positions and phases. (github.com)
Original Website: 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 provides the following key features:

- **Sunrise and Sunset Times**: SunCalc calculates precise times for sunrise and sunset for a given location and date.
- **Solar Noon**: It determines when the sun is at its highest point in the sky.
- **Sun Position**: SunCalc offers the azimuth and elevation angles of the sun at any time of day.
- **Day Length**: It calculates the duration of daylight hours.
- **Twilight Times**: The tool provides times for civil, nautical, and astronomical twilight.
- **Web Integration**: SunCalc can be integrated into websites and applications.
- **Open Source**: SunCalc is open-source, allowing developers to customize and use it freely.

3. Installation

For Python:-

```
pip install suncalc
```

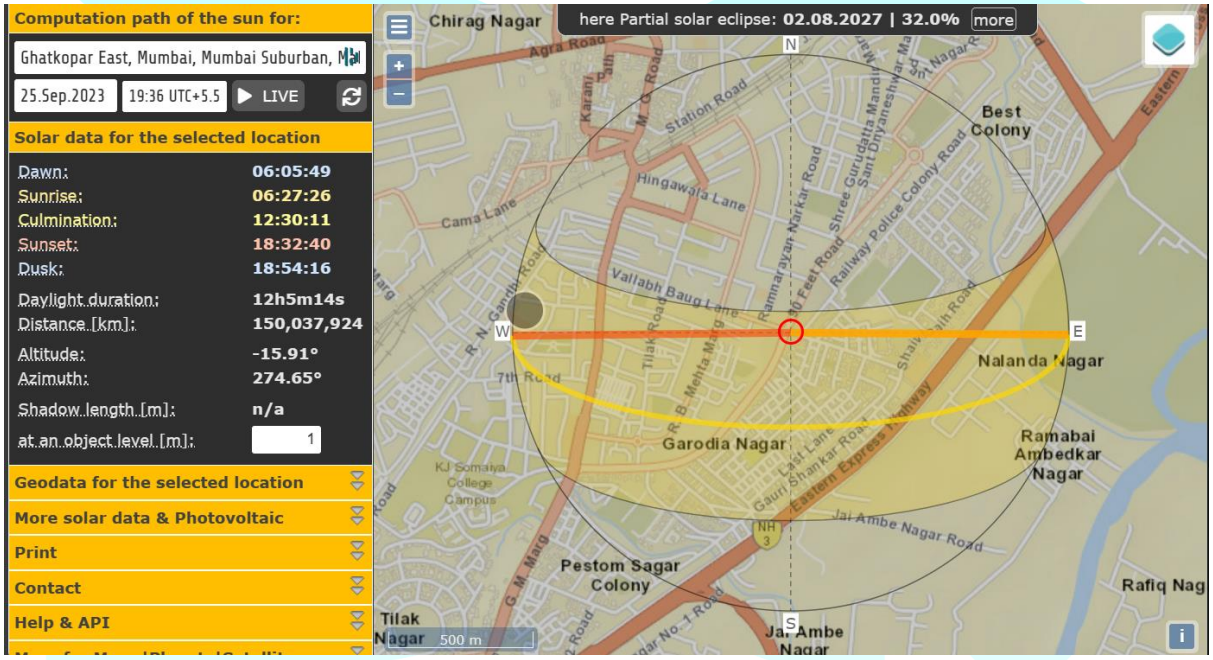
For JavaScript:-

```
$ npm install suncalc
var SunCalc = require('suncalc');
```

4. Execution

Website

- Enter location in the computation path field
- You can select Live mode to get real-time stats
- On the left corner contains various datasets
    - Solar Data
    - Geodata
    - Print Data
    - API for developers



Python

```python
import suncalc
from datetime import datetime

# Define location coordinates and date/time
latitude = 19.0760  # Example latitude for Mumbai
longitude = 72.8777  # Example longitude for Mumbai
date_time = datetime.now()  # Example date and time

# Calculate solar position
solar_position = suncalc.get_position(date_time, latitude, longitude)
solar_position2 = suncalc.get_times(date_time, latitude, longitude)

# Access specific information
sunrise = solar_position2["sunrise"]
sunset = solar_position2["sunset"]
solar_azimuth = solar_position["azimuth"]
solar_elevation = solar_position["altitude"]

# Print the results
print("Sunrise:", sunrise)
print("Sunset:", sunset)
print("Solar Azimuth:", solar_azimuth)
print("Solar Elevation:", solar_elevation)
```

This sample program gets us the Time of Sunrise, Sunset, Azimuth & Elevation of Mumbai City.

```
Sunrise: 2023-09-22 04:20:19.067323136
Sunset: 2023-09-22 16:55:35.940331264
Solar Azimuth: -0.16174352713881437
Solar Elevation: 0.3038536691717849
```

We can also get further solar times like time of Dusk, Dawn, Nautical Dusk/Dawn, and golden hour. It also works well with the *pandas* library.

Use Cases

1. **Forensic Analysis**: Suncalc can help investigators determine the exact time of day when a photo or video was taken based on the solar position in the image. This information can provide critical insights for crime scene analysis or verifying alibis.

2. **Surveillance Operations**: When planning surveillance operations, knowing the sunrise and sunset times helps determine optimal periods for covert activities. Suncalc enables analysts to assess lighting conditions, potential blind spots, and strategic positions for surveillance teams.

3. **Archaeological Research**: Archaeologists can leverage Suncalc to study ancient civilizations and their architectural orientations. By analyzing the solar azimuth and elevation, researchers can gain insights into ancient cultures' understanding of celestial alignments and their impact on structures.

4. **Outdoor Photography**: Photographers can utilize Suncalc to plan outdoor shoots and optimize lighting conditions. By understanding the solar position at different times of the day, photographers can capture stunning images with ideal lighting and shadows.

5. Scope and Limitations

- It relies on user-provided coordinates, so accuracy depends on the precision of the input.
- SunCalc provides solar data but does not consider local weather conditions, which can affect visibility.
- It requires an internet connection to access real-time data.

6. Conclusion

Suncalc is a powerful OSINT tool that unlocks valuable insights by analyzing solar positions. Whether for forensic analysis, surveillance planning, archaeological research, or photography, Suncalc provides precise information about sunrise, sunset, twilight phases, solar azimuth, and solar elevation. By incorporating Suncalc into investigations and projects, analysts can enhance their understanding of time-related events and make informed decisions based on solar position analysis.

7. References

Suncalc OSINT Tool: Harnessing the Power of Solar Position Analysis | by Amal Tom Parakkaden | OSINT TEAM

OpenAI. (2023). *ChatGPT* (August 3 Version) [Large language model]. https://chat.openai.com

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