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Frame Extractor using Python

Shreyansh Chaurasia[1], Mayank Gupta[2], Mridul Dave[3], Bhuvnesh Bhardwaj[4]

Artificial Intelligence and Data Science
Jaipur Engineering College and Research Center Sitapura, Jaipur 302022, Rajasthan, India
[1]Shreyanshchaursia20@gmail.com

Abstract

The purpose of this research is to develop a frame extractor using Python and OpenCV (cv2). The frame extractor serves as a critical tool for various applications in computer vision, video processing, and multimedia analysis. For this Frame Extractor we have used multiple modules like math, datetime,,OS and the main motive of this project is to extract the specific frame at instant time from the video easily and the frame generate from this is high resolution. This project is more helpful for video editors.

Article Status

1. Introduction

A frame extractor is a useful tool when working with video processing in Python, especially with the OpenCV library (cv2). It allows you to extract individual frames from a video file or a video stream for various purposes, such as image processing, object detection, or analysis.

There are several effective video editing features in OpenCV. Currently, OpenCV may be used to carry out procedures like picture scanning and face identification. Several procedures may be carried out on movies using the OpenCV library. Let's attempt to use CV2 to make something fun. Take a video as input, separate it into individual frames, and then store those frames. Now, these frames are capable of a variety of operations. such as flipping the video file around or cropping it, etc. We merely need to save the frames in a list and iterate reverse through the list of frames to play video in reverse mode. Use the reverse method of the list to reverse the order of frames in the list.

2. About the system and modules used

A frame extractor is frequently used in computer vision applications to extract individual frames from a video or a series of pictures. For this job, Python and the OpenCV library (cv2) are frequently used.

2.1 Math

One of the most used Python programming functions is the math function. There are several built-in math functions in Python. Python also has a math module in addition to that. We can do a variety of mathematical operations using these functions. We'll learn how to utilize some of these functions here as we concentrate on Python Math.

Three sections of maths will be covered here. With various code examples, we will master the fundamental math operations in the first section. Different Python Math routines will be covered in the second section. The Python math module will also be covered in the last section.
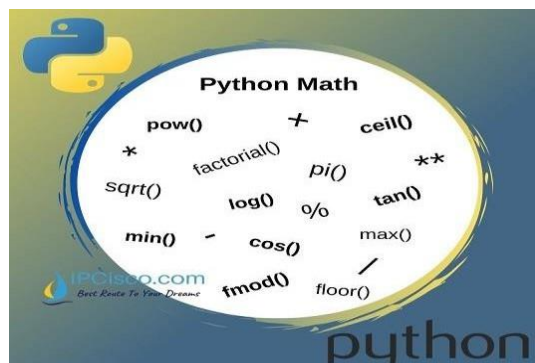
2.2 OS

A portable method of exploiting operating system-dependent functionality is offered by this module. To simply read or write a file, use the open() function. To change paths, use the os.path module. To read every line in every command-line file, use the file input module. See the tempfile module for producing temporary files and directories, and the shutil module for high-level file and directory operations.
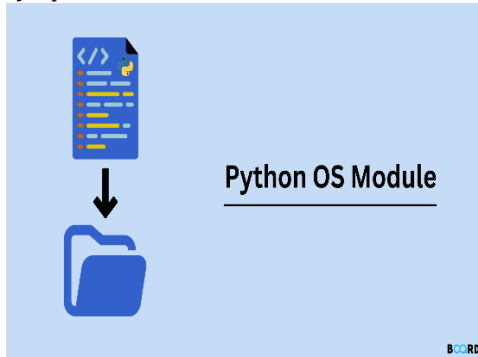

2.3 Datetime

Date and time are not data types in Python on their own, but they may be used together by importing the DateTime module. There is no requirement to install the Python Datetime Module outside because it is already included in Python.

Python uses the date class to create date objects. When this class's objects are created, they represent dates with the format YYYY-MM-DD. Year, Month, and Date are the three required parameters for the constructor of this class.

The time class creates the time object which represents local time, independent of any day.
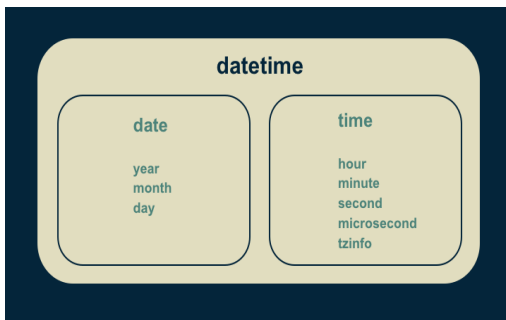
2.3 OpenCV(CV2)

The vast open-source library known as Open CV is used for computer vision, machine learning, and image processing. It currently plays a significant part in real-time operation, which is crucial in modern systems. Using it, one may analyze pictures and movies to find people, objects, and even human handwriting. Python is able to handle the Open CV array structure for analysis when it is coupled with other libraries, such as Numpy. We employ vector space and apply mathematical operations to these characteristics to identify visual patterns and its different features. One needs Python and PIP already installed on their machine in order to install Open CV.
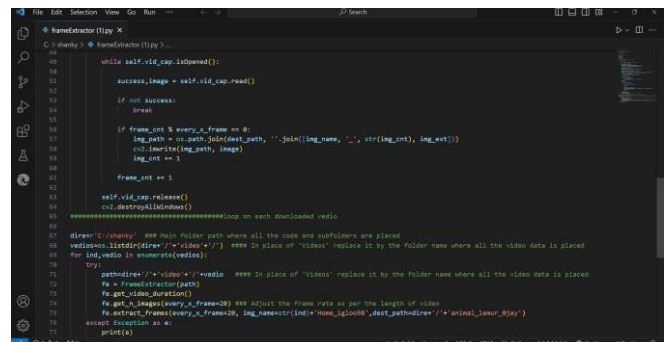

3.1 Working

Here are some screenshots of the codes and showing how this frame extractor is working.
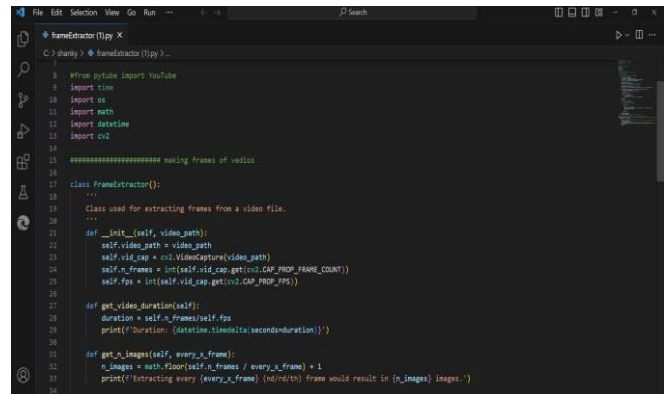
Code 1

In this, section of the code show's all the modules that have used in the code.
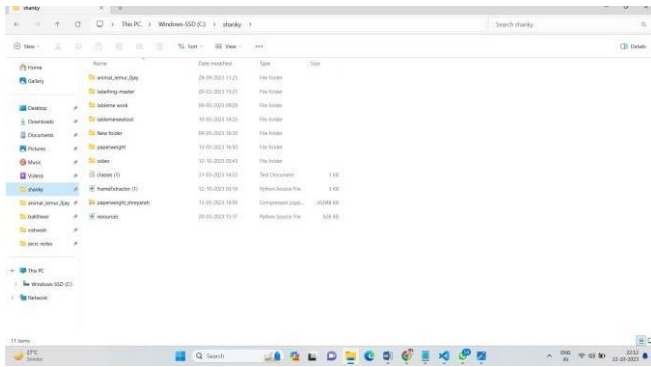

Code 2

Fig 1

This is the screenshot of the directory where all the code and the folder are placed which have been used in the project.
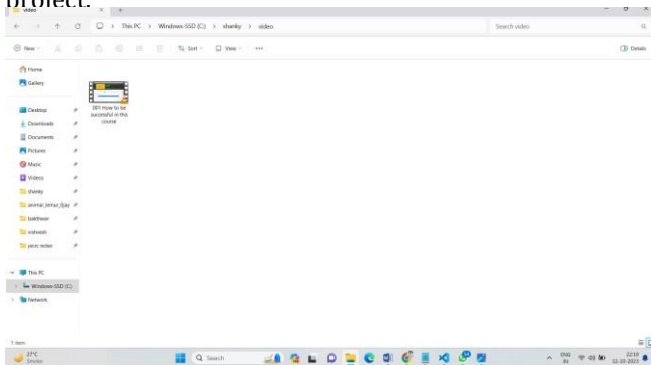

Fig 2

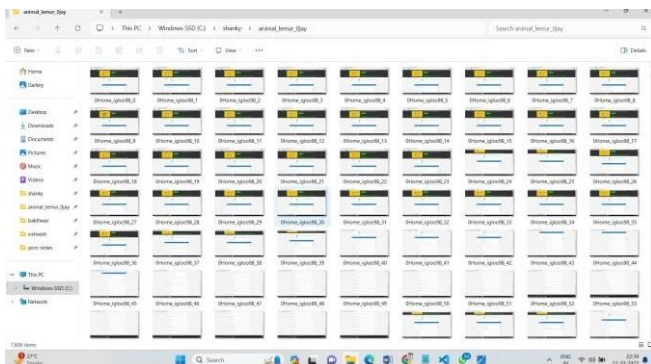This is the folder where we put that video file whose frame that we want.

4. Conclusion:

Fig 3

In this folder all the frames are saved that are generated by the frame extractor.

References

1. Dr.Vinita Mathur,Associate Professor; Department of Electronic and Communication Engineering ,Jaipur Enginnering College and Research Centre,Jaipur,India

2. K. R. Srinath Associate Professor, Department of Computer Science, Pragati Mahavidyalaya Degree and PG college, Hanuman Tekdi, Koti, Hyderabad, Telangana, India