MINI PROJECT

(2022-23)

“CARTOONIFY”

Project Report

Institute of Engineering & Technology

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Declaration

I/we hereby declare that the work which is being presented in the Bachelor of technology. Project **"CARTOONIFY"**, in partial fulfillment of the requirements for the award of the ***Bachelor of Technology*** in Computer Science and Engineering and submitted to the Department of Computer Engineering and Applications of GLA University, Mathura, is an authentic record of my/our own work carried under the supervision of **Mr. Abhishek Kumar Tiwari, Technical Trainer, Dept. of CEA,GLA University.**

The contents of this project report, in full or in parts, have not been submitted to any other Institute or University for the award of any degree.

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Certificate

This is to certify that the project entitled “CARTOONIFY”, carried out in Mini Project – I Lab, is a bonafide work by Aryan Gupta and Rishabh Sharma and is submitted in partial fulfillment of the requirements for the award of the degree Bachelor of Technology (ComputerScience & Engineering).

Signature of Supervisor:

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ACKNOWLEDGEMENT

Presenting the ascribed project paper report in this very simple and official form, we would like to place my deep gratitude to GLA University for providing us the instructor Mr Abhishek Kumar Tiwari, our technical trainer and supervisor.

He has been helping us since Day 1 in this project. He provided us with the roadmap, the basic guidelines explaining on how to work on the project. He has been conducting regular meeting to check the progress of the project and providing us with the resources related to the project. Without his help, we wouldn't have been able to complete this project.

And at last but not the least we would like to thank our dear parents for helping us to grab this opportunity to get trained and also my colleagues who helped me find resources during the training.

Thanking You

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ABSTRACT

Since the client for animation pictures recovery framework focuses to get applicable pictures to inquiry picture from information base inside same item (for example a client has animation picture with object, for this situation the client will focus to get all significant picture with, along these lines A significant advance in animation picture recovery is characterizing the item inside animation picture .In this paper, a proficient technique for objects extraction from animation pictures is presented; it depends on broad suppositions identified with shading and areas of items in animation pictures, the items are commonly gravitated toward the focal point of the picture, the foundation tones is the all the more much of the time gravitated toward the edges of animation picture, and the item colors is less touch for the edges. The cycles of shading quantization, seed filling and found the item apparition have been utilized. The aftereffects of led tests showed that the framework have promising effectiveness for extricating both single or multi object(s) lay in straightforward and complex foundation
Of image cartoonification.

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CHAPTER-1

INTRODUCTION

1.1 CONTEXT

This Android Application “Cartoonify” has been submitted in partial fulfilment of the requirements for the award of the degree of Bachelor of Technology in Computer Science and Engineering at GLA University, Mathura supervised by Mr. Abhishek Kumar Tiwari. This project has been completed approximately in a month and has been executed in modules, meetings have been organised to check the progress of the work and for instructions and guidelines.

1.2 MOTIVATION

Animation pictures assume basic parts in our regular day to day existences particularly in diversion,training, and promotion, that become an inexorably escalated research in the field of media and PC designs. The naturally animation object extraction is exceptionally helpful in numerous applications; one of the most significantly is the animation pictures recovery, where the client for animation pictures recovery framework focuses to get comparable pictures to question picture from information base in character (i.e., a client has animation picture with object Dora, so the client will focus to get all applicable picture with Dora character). Today, various analysts have misused the ideas identified with content based pictures recovery (CBIR) to look for animation pictures containing specific object(s) of interest . A few area based recovery techniques proposed, for additional subtleties see . A portion of the programmed techniques, which separate the region(s) of premium from the other less helpful areas in a picture, have been adjusted to recover animation characters [7-8]; they utilize incomplete highlights for perceiving locales and additionally angles which are reasonable for animation portrayal or signal acknowledgment. A few endeavors go past separating focal articles [3], others utilized Salient Object Detection (SOD) [9-12]. In this paper, a basic programmed strategy for objects extraction from animation picture is proposed; it is based on the suspicion that the needed item is established inside or near the focal piece of picture.

1.3 OBJECTIVE

The main objective of this application is to create a Book Finder app named “Cartoonify” which will have a lot of e-books and a space to keep up the books one wants to read. There will be a facility to search any book one wishes to read by the use of any keyword like the author name, book name, the name of the subject. After the search there will be list of related books and one can view and read more about the details of the book and can further purchase it.

This application developed can be used at a variety of places, at education hubs and have its significance. The goal of the app was to provide a way to the learners and users to get all the books they desire to read at a particular location rather than randomly surfing the Internet.

1.4 SOURCES

The source of our project (including all the project work, documentations and presentations) will is available at the following link

GitHub Repository link:

https://github.com/aryangupta777/cartoonify.git

Google Drive link:

https://drive.google.com/drive/folders/15q45izQZbS8zYUtOu7C1QofqSpGKL2la?usp=sharing

CHAPTER -2

SOFTWARE REQUIREMENT ANALYSIS

2.1 IMPACT OF ON DAILY LIFE

Cartoonizing an image with transform an image into its cartoon form . Today we found many numbers of application on internet to convert images to cartoon effect. Cartoon style have unique style identification with high level signification, abstraction and carton image tends to clear edges, smooth color and relatively simple textures which exhibits signification for texture description based on loss function used in existing method. There are multiple properties in image processing. Each picture of the element together viewed as 2-D matrix . In this field of research processing an image consisting of an identifying an object in image, identifying an image, number of objects, changing the images to blur edges and such effects are highly appreciated.

2.2 HARDWARE AND SOFTWARE REQUIREMENTS

Hardware Requirement

- Operating System :Any Operating System
- RAM : 2 GB (or higher)
- Hard disk : 256GB

Software Requirement

- Python: We use python as a programming language for building the application.
- cv2: We use cv2 for image processing.
- Numpy: Mainly NumPy is used for dealing with arrays. Here the imagesthat we use are stored in the form of arrays. So for that, we use NumPy.
- easygui: easygui is a module used for GUI programming in python. In our application easygui is used to open the file box to upload images from the local system.
- Imageio: Imageio is a python library that reads and writes the images.
- Matplotlib: Matplotlib is used for visualization purposes. Here we plot the images using matplotlib.
- OS: Here in our application os is used for dealing with paths like reading images from the path and saving the image to the path.

CHAPTER-3

TECHNOLOGY USED

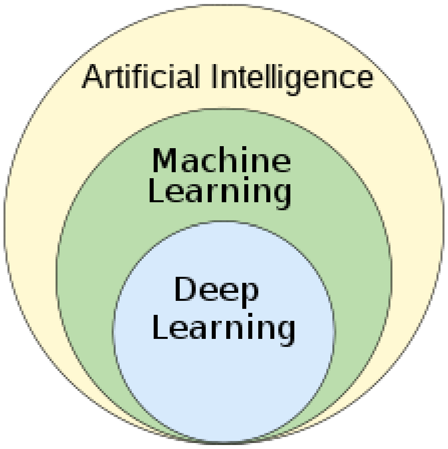
Machine Learning

Machine learning (**ML**) is a field of inquiry devoted to understanding and building methods that 'learn', that is, methods that leverage data to improve performance on some set of tasks. It is seen as a part of artificial intelligence. Machine learning algorithms build a model based on sample data, known as training data, in order to make predictions or decisions without being explicitly programmed to do so.[2] Machine learning algorithms are used in a wide variety of applications, such as in medicine, email filtering, speech recognition, agriculture, and computer vision, where it is difficult or unfeasible to develop conventional algorithms to perform the needed tasks.[3][4] A subset of machine learning is closely related to computational statistics, which focuses on making predictions using computers, but not all machine learning is statistical learning. The study of mathematical optimization delivers methods, theory and application domains to the field of machine learning. Data mining is a related field of study, focusing on exploratory data analysis through unsupervised learning.Some implementations of machine learning use data and neural networks in a way that mimics the working of a biological brain. In its application across business problems, machine learning is also referred to as predictive analytics.

Learning algorithms work on the basis that strategies, algorithms, and inferences that worked well in the past are likely to continue working well in the future. These inferences can be obvious, such as "since the sun rose every morning for the last 10,000 days, it will probably rise tomorrow morning as well". They can be nuanced, such as "X% of families have geographically separate species with color variants, so there is a Y% chance that undiscovered black swans exist".

Machine learning programs can perform tasks without being explicitly programmed to do so. It involves computers learning from data provided so that they carry out certain tasks. For simple tasks assigned to computers, it is possible to program algorithms telling the machine how to execute all steps required to solve the problem at hand; on the computer's part, no learning is needed. For more advanced tasks, it can be challenging for a human to manually create the needed algorithms. In practice, it can turn out to be more effective to help the machine develop its own algorithm, rather than having human programmers specify every needed step.

The discipline of machine learning employs various approaches to teach computers to accomplish tasks where no fully satisfactory algorithm is available. In cases where vast numbers of potential answers exist, one approach is to label some of the correct answers as valid. This can then be used as training data for the computer to improve the algorithm(s) it uses to determine correct answers. For example, to train a system for the task of digital character recognition, the MNIST dataset of handwritten digits has often been used.



Languages And Libraries

- Python : Python is a high-level, general-purpose programming language. Its design philosophy emphasizes code readability with the use of significant indentation.

  Python is dynamically-typed and garbage-collected. It supports multiple programming paradigms, including structured (particularly procedural), object-oriented and functional programming. It is often described as a "batteries included" language due to its comprehensive standard library.

- cv2 : cv2 is **the module import name for opencv-python**, "Unofficial pre-built CPU-only OpenCV packages for Python". The traditional OpenCV has many complicated steps involving building the module from scratch, which is unnecessary.

- Numpy: NumPy is **a python package used for numerical and scientific computing**. It provides better runtime and space complexity. It provides a wide variety of array operations. If you wish to perform general-purpose operations, use python lists.

- easygui: easygui is a module used for GUI programming in python. In our application easygui is used to open the file box to upload images from the local system.

- Imageio: Imageio is a python library that reads and writes the images.

- Matplotlib: Matplotlib is used for visualization purposes. Here we plot the images using matplotlib.

- OS: Here in our application os is used for dealing with paths like reading images from the path and saving the image to the path

OpenCV :-

OpenCV is an open-source library in python that is used mainly for computer vision tasks in the areas of machine learning and artificial intelligence. Nowadays, openCV is playing a major role in the field of technology. Using OpenCV we can process images and videos for some tasks like object detection, face detection, object tracking, and all.

OpenCV has c, c++, java, and python interfaces and it supports all kinds of systems such as Windows, Linux, Android, Mac OS, IoS, and all…

CHAPTER -4

IMPLEMENTATION AND USER INTERFACE

5.1 Implementation of the Cartoonify:

We aim to transform images into its cartoon. Yes, we will CARTOONIFY the images. Thus, we will build a python application that will transform an image into its cartoon using OpenCV.

5.1.1 Step to be followed to develop the app:

1. We will build the main window of our application, where the buttons, labels, and images will reside. We also give it a title by title() function.

2. To convert an image to a cartoon, multiple transformations are done.

3. An image is converted to a Grayscale image. Yes, similar to the old day's pictures.!

4. The Grayscale image is smoothened, and we try to extract the edges in the image.

5. We form a color image and mask it with edges.

6. To smoothen an image, we simply apply a blur effect.

7. This creates a beautiful cartoon image with edges and lightened color of the original image.

8. We will try to retrieve the edges and highlight them.

9. We prepare a lightened color image that we mask with edges at the end to produce a cartoon image.

10. Let’s combine the two specialties. This will be done using MASKING. We perform bitwise and on two images to mask them.

5.1.2 Step to be followed by the user

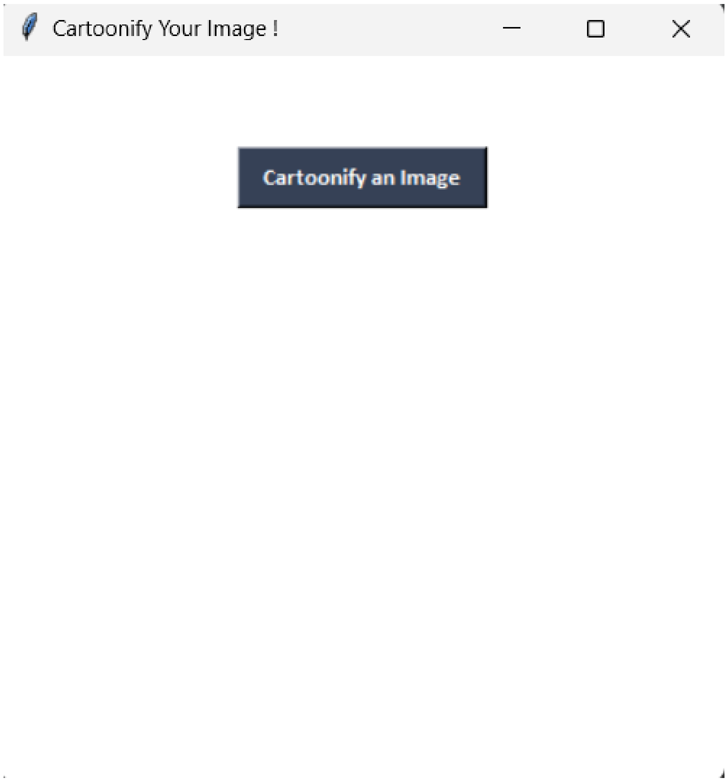
- Run the application .

- Upload the original picture which you want to cartoonify by clicking “Cartoonify an Image”.

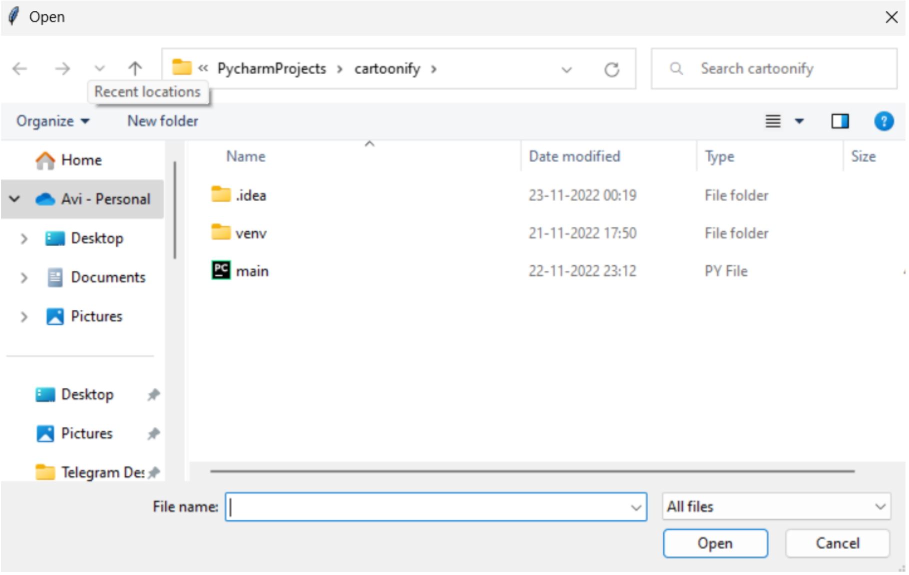
- To save the cartoonify image , click “Save cartoon image”.

5.1 User Interface

- **Step 1**

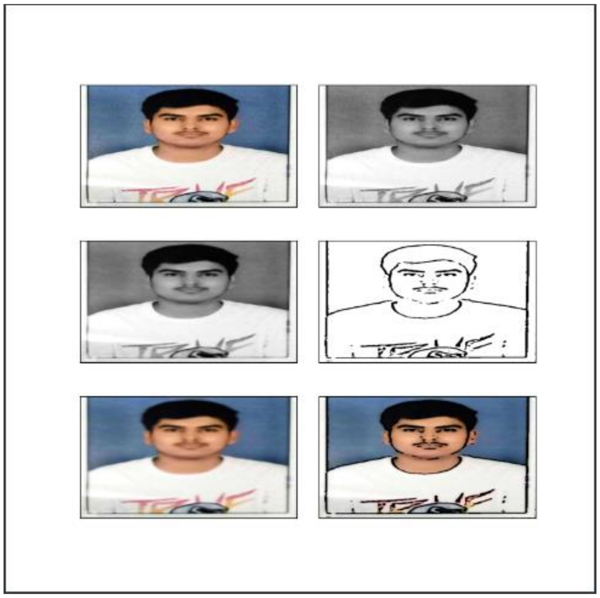


- **Step 2**

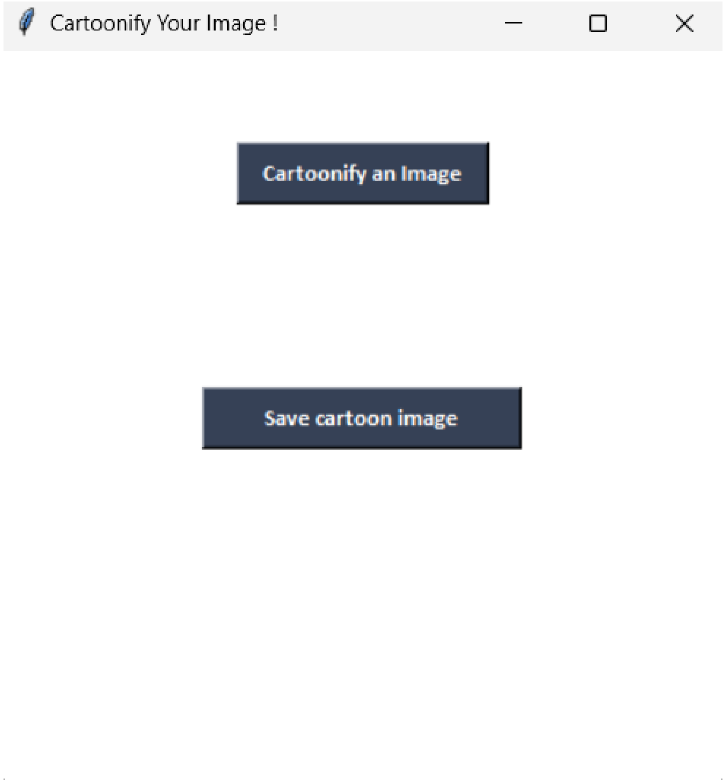


Name	Date modified	Type	Size
.idea	23-11-2022 00:19	File folder	
venv	21-11-2022 17:50	File folder	
main	22-11-2022 23:12	PY File	

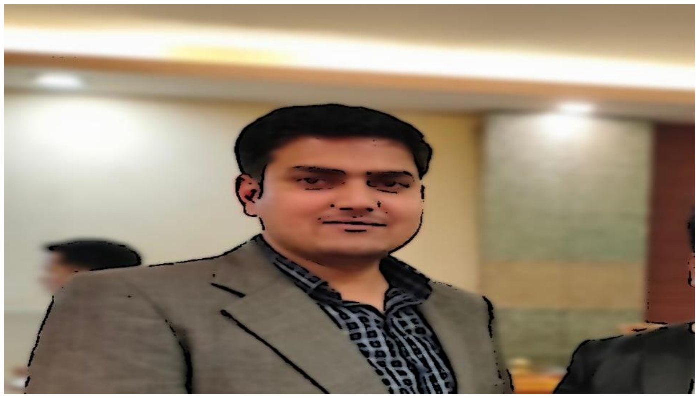
- **Step 3**

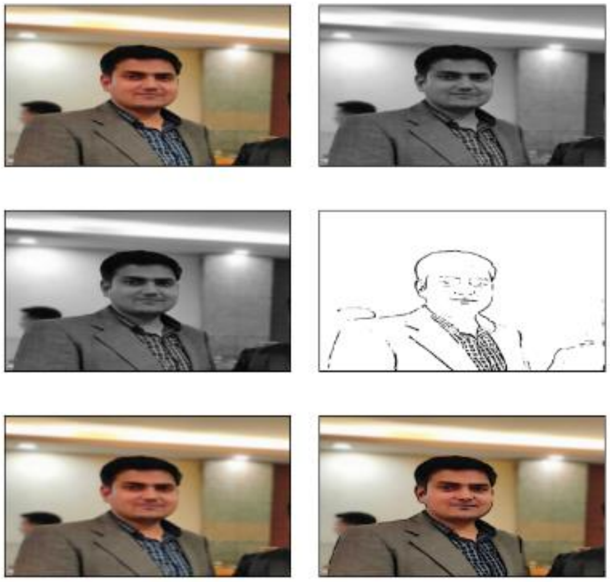


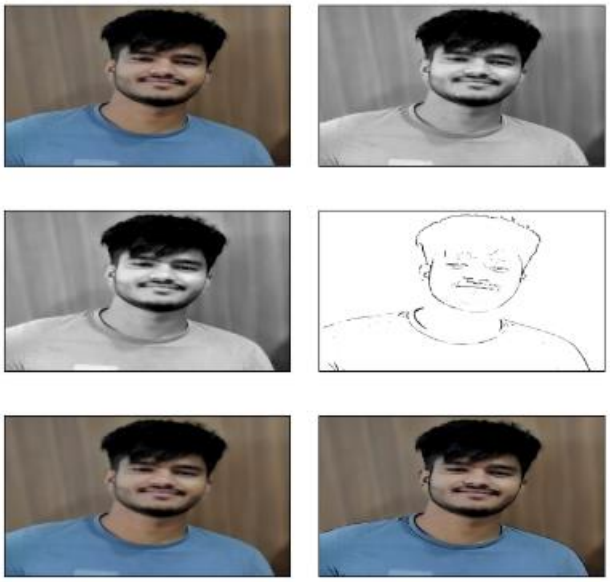
- **Step 4**



Sample







CHAPTER -7

CONCLUSION

Finally, we will get the output image as shown above. It contains all the 6 transitions of the image. And the final image is the cartoon image. I hope you have enjoyed this application. This is the “Cartoon Version” of the image. Now using this application, you can create your cartoon image. This is Thrilling!!!!!!

Overall in this article, we have seen

- How to build an application to convert an image into its cartoon form.
- How to use Tkinter to provide GUI.
- How to use easygui
- Working on the application

REFERENCES

BOOKS

Hands-on ML with Scikit-Learn, Keras & TensorFlow

Machine Learning for Absolute Beginners: A Plain English Introduction.

Websites:

- www.pythonprojects.com
- www.geeksforgeeks.org
- www.google.com
- www.projectdeveloper.com