

MES COLLEGE OF ENGINEERING, KUTTIPPURAM
DEPARTMENT OF COMPUTER APPLICATIONS
20MCA246 – MAIN PROJECT

PRO FORMA FOR THE APPROVAL OF THE FOURTH SEMESTER MAIN PROJECT

(Note: All entries of the pro forma for approval should be filled up with appropriate and complete information. Incomplete Pro forma of approval in any respect will be rejected.)

Main Project Proposal No : _____
(Filled by the Department)

Academic Year : 2021- 22
Year of Admission : 2020

1. Title of the Project : Cartoonify
2. Name of the Guide : Mr. Balachandran K P
3. Student Details (in BLOCK LETTERS)

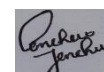
Name

PANCHAMI.P.M

Register Number

MES20MCA-2038

Signature



Date: 16/04/2022

Approval Status : Approved / Not Approved

Signature of
Committee Members }

Comments of the Guide

Dated Signature

Initial Submission :

First Review :

Second Review :

Comments of the Project Coordinator

Dated Signature

Initial Submission:

First Review

Second Review

Final Comments :

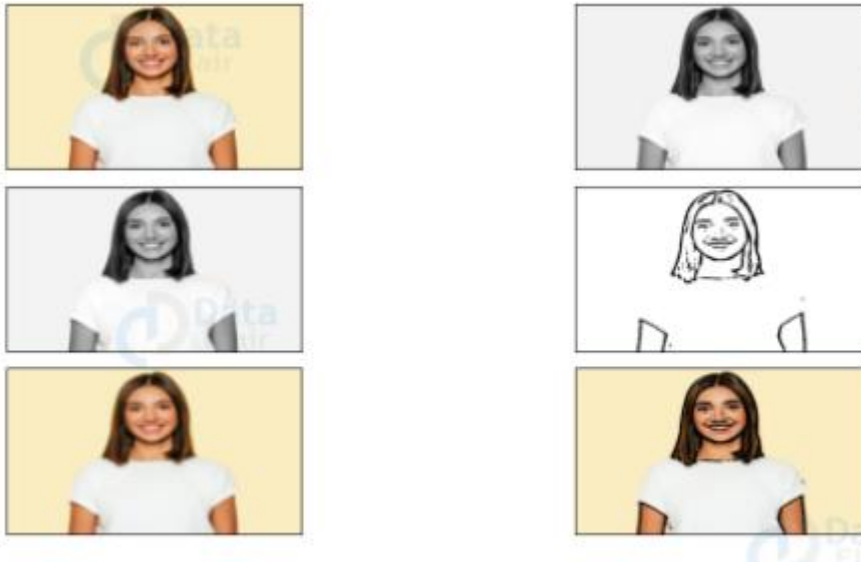
Dated Signature of HOD

Cartoonify Panchami.P.M

Introduction: Almost all people are left with very precious and unforgettable memories of our childhood. So today let's head towards giving our pictures some cartoonic effects. In this project I am going to develop an application that can convert an image to its cartoon image. Thus, I am going to build a python application that will transform an image into its cartoon using OpenCV. To convert an image to a cartoon, multiple transformations are done. Firstly, an image is converted to a Grayscale image. Then, the Grayscale image is smoothened, and try to extract the edges in the image. Finally, form a colour image and mask it with edges. This creates a beautiful cartoon image with edges and lightened colour of the original image.

Objectives: As you might know, sketching or creating a cartoon doesn't always need to be done manually. Nowadays, many apps can turn your photos into cartoons. But what if I tell you, that you can create your own effect with few lines of code? This app will be useful for any age. This app can instantly turn your pictures into cartoons. This project will help me to get acquainted with more machine learning libraries in Python.

Problem Definition: I aim going to build an application like



this:

- CV2: Imported to use OpenCV for image processing
- easygui: Imported to open a file box. It allows us to select any file from our system.
- Numpy: Images are stored and processed as numbers. These are taken as arrays. We use NumPy to deal with arrays.
- Imageio: Used to read the file which is chosen by file box using a path.
- Matplotlib: This library is used for visualization and plotting. Thus, it is imported to form the plot of images.
- OS: For OS interaction. Here, to read the path and save images to that path.

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Basic functionalities:

1. Importing the required modules
2. Building a File Box to choose a particular file
3. Transforming an image to grayscale
4. Smoothening a grayscale image
5. Retrieving the edges of an image
6. Preparing a Mask Image
7. Giving a Cartoon Effect
8. Plotting all the transitions together
9. Functionally of save or download button

Hardware Requirements

- Input Device : Mouse, Keyboard
- Output Device : Monitor
- Memory : 4 Gb Ram(Minimum)
- Processor : Intel core i3 or above

Software Requirements

- Operating System : Windows 8 /10for Better Performance
- Front End : Python
- Software Used : Jupiter Notebook

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1. Title of the Project : Image Segmentation
2. Name of the Guide : Mr. Balachandran K P
3. Student Details (in BLOCK LETTERS)

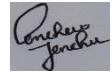
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Image Segmentation

Panchami.P.M

Introduction: When there is a single object present in an image, the image localization technique will be used to draw a bounding box around that object. In the case of object detection, it provides labels along with the bounding boxes, hence can predict the location as well as the class to which each object belongs. Image segmentation results in more granular information about the shape of an image and thus an extension of the concept of Object Detection. Image segmentation results in more granular information about the shape of an image and thus an extension of the concept of Object Detection.

Image Segmentation can be broadly classified into two types:

1. Semantic Segmentation

Semantic Segmentation is the process of segmenting the image pixels into their respective classes.

2. Instance Segmentation

Instance segmentation is being more thorough and usually comes into picture when dealing with multiple objects.

Objectives: Image segmentation is one of the most important criteria in computer vision to analyse the image. The objective of image segmentation is to extract information that is represented in the form of data from image via image segmentation, feature measurement and object representation. The aim of image segmentation depends on the accuracy of feature extraction. Image segmentation is also the part of computer aided system. It is used to subdivide an image into its constituent parts and extracts those parts of interest or objects.

Image segmentation can be used in self-driving cars for giving easy distinctions between various objects.

Image segmentation can be used to extract clinically relevant information from medical reports.

Problem Definition: Here I am going to perform image segmentation using the Mask R-CNN architecture. It is an extension of the Faster R-CNN Model which is preferred for object detection tasks.

The Mask R-CNN returns the binary object mask in addition to class label and object bounding box. Mask R-CNN is good at pixel level segmentation.

Mask R-CNN uses an architecture similar to its predecessor Faster R-CNN and also utilizes Fully Convolutional Network for pixel-wise segmentation.

1. Feature Extraction

Here, utilize the ResNet 101 architecture to extract features from the input image. As a result, we get feature maps which are transmitted to Region Proposed Network

2. Region Proposed Network (RPN)

After obtaining the feature maps, bounding box candidates are determined and thus RPN extracts RoI (Region of Interest)

3. RoI Pool

Faster R-CNN uses an RoI Pool layer to compute features from the obtained proposals in order to infer the class of the object and bounding box coordinates.

4. RoI Align

RoI pool led to misalignments in getting the Region of Interest due to quantization of RoI coordinates. Since pixel-level segmentation required specificity hence authors of the Faster R-CNN cleverly solved it by implementing the RoI Align.

Masking is done by a small fully-connected network applied to each RoI, which predicts a segmentation mask in a pixel-to-pixel manner.

Basic functionalities:

Image segmentation is the process of individually identifying and labeling every pixel in an image, where each pixel having the same label shares certain characteristics. It can detect an object at a granular level and it can identify the shape of that object also. It is an advanced and more accurate way of detecting an object's edge and shape detection. Image segmentation divides an image into different partitions known as segments. This collection of segments are represented by a mask or a labeled image. In this way, we can process only the important segments instead of the entire image.

Hardware Requirements

- Input Device : Mouse, Keyboard
- Output Device : Monitor
- Memory : 4 Gb Ram(Minimum)
- Processor : Intel core i3 or above

Software Requirements

- Operating System : Windows 8 /10for Better Performance
- Front End : Python
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1. Title of the Project **Driver Drowsiness Detection System**
2. Name of the Guide : **Mr. Balachandran K P**
3. Student Details (in BLOCK LETTERS)

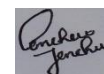
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Introduction: With this Python project, I am going to make a drowsiness detection system. A countless number of people drive on the highway day and night. Taxi drivers, bus drivers, truck drivers and people traveling long-distance suffer from lack of sleep. Due to which it becomes very dangerous to drive when feeling sleepy. The majority of accidents happen due to the drowsiness of the driver. So, to prevent these accident I am going to build a system using Python, OpenCV, and Keras which will alert the driver when he feels sleepy.

Objectives: The drowsiness of drivers is one of the significant causes of road accidents. By detecting the driver's drowsiness, road accidents can be reduced. The end goal is to detect not only extreme and visible cases of drowsiness but allow this system to detect softer signals of drowsiness as well.

Problem Definition: Face detection is employed to locate the regions of the driver's eyes, which are used as the templates for eye tracking in subsequent frames. Finally, the tracked eye's images are used for drowsiness detection in order to generate warning alarms. This proposed approach has three stages: detecting Face, detecting Eyes and detecting drowsiness. Image processing is used to recognize the face of the driver and then it extracts the image of the eyes of the driver for detection of drowsiness.

Basic functionalities: In this Python project, we will be using OpenCV for gathering the images from webcam and feed them into a Deep Learning model which will classify whether the person's eyes are 'Open' or 'Closed'. The approach we will be using for this Python project is as follows :

Step 1 – Take image as input from a camera.

Step 2 – Detect the face in the image and create a Region of Interest (ROI).

Step 3 – Detect the eyes from ROI and feed it to the classifier.

Step 4 – Classifier will categorize whether eyes are open or closed.

Step 5 – Calculate score to check whether the person is drowsy.

Hardware Requirements

- Input Device : Mouse, Keyboard
- Output Device : Monitor
- Memory : 4 Gb Ram(Minimum)
- Processor : Intel core i3 or above

Software Requirements

- Operating System : Windows 8 /10for Better Performance
- Front End : Python
- Software Used : Jupiter Notebook