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Recreating pictures of landscape using Turtle

1. Description:

I will use Machine learning to analyse a picture of a landscape that will find what are the important lines in the images and with this data I will recreate this picture using turtle library in python. I will recreate the image in black and white. If the time permits, I will try to add the actual colours to the drawing. Otherwise, if it gives good result, I will colour each form using a random colour. Like that my output becomes more interesting and even artistic.

2. Choice of dataset: <https://www.kaggle.com/datasets/arnaud58/landscape-pictures>

My dataset consists of pictures of landscape of all kinds. I chose this dataset since it is a large dataset so I can train well my program and still leave a lot of pictures to the testing set. Also, the dataset is quite diversified in terms of the kind of landscape it is composed of which will permit me to test my program for any kind of pictures the user would want to recreate

3. Methodology:

3.a: To process my data I will first convert my image into black and white to reduce the difficulty of the project. Then, I will rescale my data so that every image have the same importance in my training set.

I used this website to help me with the step of data processing image data:
<https://www.section.io/engineering-education/image-preprocessing-in-python/>

3b: This project uses computer vision. I will mostly concentrate to edge detection of the image. By finding the edge I can use turtle to redraw them which will recreate my image created. By using edge detection, the form created will be simple to recreate using Turtle.

I used this website to understand better what edge-detection was: <https://neptune.ai/blog/image-processing-python>

3c: The metric generally used in edge detection is MSE. This metric will allow me to reduce the difference between the original image and the new image having only the edges.

I used these websites to understand better the evaluation metric needed:
<https://arxiv.org/pdf/1801.00454.pdf>, <https://www.mathworks.com/help/vision/ref/psnr.html>

4. Application

The user will submit an image of a landscape and the program will output the turtle image created.