Project Synopsis on:

IMAGE COLORIZATION

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Name/Title of the Project:

Image Colorization

Testing Technologies to be used:

Back end: Python

Hardware & Software to be used:

Hardware	Processor: Intel I5-9400F.
	Ram: 8 Gb.
	Hard Disk: 1 Tb Hdd.
Software	Windows 10 Operating System.
	VSCode, Python IDE or Jupyter Notebook.

Objective and scope of the Project:

Image colorization is a widespread problem within computer vision. The ultimate objective of image colorization is to map a gray-scale image to a visually plausible and perceptually meaningful color image.

Methodology:

- Deep Learning Methods is used in this project. The expectation that one or more reference images might contain sufficient color information for satisfactory colorization results is usually not realistic.

- The evolution of deep learning techniques has enabled training of an artificial neural network with a large number of source images. For colorization, it means automatically learning colors that naturally correspond to real objects.

- The methods yield better results by adding more layers to the neural network and more images to the training set.

- Given a grayscale photograph as input, this project attacks the problem of hallucinating a *plausible* color version of the photograph

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- This problem is clearly underconstrained, so previous approaches have either relied on significant user interaction or resulted in desaturated colorizations.

- I propose a fully automatic approach that produces vibrant and realistic colorizations.

Statement about the Problem:

Image colorization was reserved to artists that aimed to give the original colors to a picture. In reality, Photoshop is still used for manual colorization of professional images. Despite the fact that there are many image conditions to take into account, it is a difficult problem.

Why is the particular topic chosen?

Rich colours can not only express more information but also improve the humanvisual experience. Color has a significant part in how humans process the world.In the area of digital image processing, picture colorization has seen a lot of resarch activity. It is a crossdisciplinary topic that involves the fields of computer vision, computer graphics, pattern recognition, and human computer interaction.
The process of colorization has been widely applied in a variety of industries, in cluding cartoon automatic colorization, vintage film colour restoration, and gray scale photo colorization.

What contribution would the project make?

- ➢ Reduces hours of supervised work.
- ➢ Time Saving.
- ➢ A lot of manual work will be automated due to this system.
- ➢ Provides Quick Results.

Future Scope:

Although it works reasonably well on a small set of training images, our current algorithm works better when the training set comprises of similar images. The model is susceptible to noise when non-related images are introduced, which requires some internal classification.

Conclusion:

This project validates that an end-to-end deep learning architecture could be suitable for some image colorization tasks. Overall, I believe that while image colorization might require some degree of human intervention it still a huge potential in the future and could eventually reduce hours of supervised work.

References:

1) Nguyen. Tung, Mori. Kazuki, Thowanmas. Ruck, 2016; Image Colorization Using a Deep Convolutional Neural Network.

2) AISegment.com - Matting Human Datasets, Kaggle3.

3) Dahl, Ryan Automatic colorization (2016).

4) Medsker, L. R., and L. C. Jain.Recurrent neural networks , Design and Applications 5 (2001).