Paper title: Bringing Monochrome to Life: A GAN-based Approach to Colorizing Black and White Images

Paper link:

1 Summary:

1.1 Motivation:

The purpose of the paper "Bringing Monochrome to Life: A GAN-based Approach to Colorizing Black and White Images" is to present a new technique for automatic image colorization that can restore old or damaged photos. The authors aim to use a Conditional Generative Adversarial Network (Conditional GAN) to colorize black and white images and improve the quality of the colorization process.

1.2 Contribution:

The authors' contribution is the development of a new method for automatic image colorization that uses a Conditional GAN. They also propose the use of quantitative metrics such as PSNR and RMSE to assess the performance of the model.

1.3 Methodology:

The authors used a U-Net architecture model with a regression loss as a baseline and extended it to adversarial networks with a DCGANs-based generator and discriminator models. They utilized CIFAR-10 and Places365 datasets for their study and employed Lab* color space for colorization. The model inputs are a grayscale image concatenated with a colored image from the generator or true labels.

1.4 Conclusion:

The authors concluded that their method of using a Conditional GAN for automatic image colorization is effective and can restore old or damaged photos. They also suggest that the use of quantitative metrics such as PSNR and RMSE can help assess the performance of the model.

2 Limitations:

2.1 First Limitation/Critique:

One limitation of the paper is that the L2 loss function applied to the baseline CNN caused a blurring effect, leading to the "Sepia effect." This could be improved by using a different loss function.

2.2 Second Limitation/Critique:

Another limitation is that the authors only used two datasets for their study. Using more datasets could improve the generalizability of the model.

3 Synthesis:

The ideas presented in the paper have potential applications in the restoration of old or damaged photos. This technique could also be applied to other types of images besides

photographs, such as paintings or drawings. Future scopes could include the development of more robust metrics for assessing the performance of the model and the use of more datasets to improve the generalizability of the model.