**Denoising Images Using Autoencoders**

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**Abstract**

Signals can come in many forms, such as video, text, audio, and images. Images have become incorporated into our daily lives; social media such as Facebook and Instagram are methods of socialization through pictures. Unfortunately, images contain so much information that the chances of corruption increase. Image corruption often occurs when unwanted noise becomes embedded into the image for numerous reasons, such as hardware limitations stemming from poor camera lenses, sensors, and processing power, which can lead to a corrupted image. Moreover, not all photos are picture-perfect; therefore, there is a need for an efficient method to reconstruct images. This paper proposes an autoencoder-based deep learning model to regenerate corrupted images to their proper form while extracting important features from these images. Experimental results demonstrated that the autoencoder could reconstruct various types of corruption.

**I. INTRODUCTION**

[11]

Big Data encompasses 3Vs, volume. Velocity and variety, all the images are processed by the enormous number of bites that can range up to Petabytes. Processing vast amounts of data require significant computing power from the hardware perspective or the need for a distributed system. Image processing applies computational techniques to process images. The input from the image and the properties are further processed to either enhance or extract features. For example, image processing can draw out significant features to reduce dimensionality or remove noise.

[11]

[01]

*Curse of Dimensionality*

The issue that can arise from dealing with large volumes of images is the curse of dimensionality. The curse refers to the difficulties when working with data that contain high dimensions. High dimensions are several features or attributes present in the dataset. For example, digital images, there are typically three-dimensional. The first dimension is the height composed of columns and the width composed of rows. Culminated together creates a matrix. These images are composed of height, width, and channel. To add more complexity are channels; images can have these channels Red (R), Green (G), Blue (B). The pixel value for each row and column coordinates in the image are mapped to each channel.

*Feature Engineering*

Dimensionality affects the processing, prediction, and performance of a model. Therefore, as the number of features increases, the machine learning capabilities decrease.

Extracting essential features that represent the data aids in creating robust machine learning models. However, the chances of noisy/corrupted images increase due to dimensionality; Therefore, features cannot be extracted from these images. Thus, it proposes the challenge of processing noisy data to improve machine learning performance, processing, and predictive capabilities. Autoencoders are well known to reduce dimensions, much like Primary Component Analysis; in addition to denoise corrupted images.

[01]

II. EXISTING METHODS

III. NEW METHODS

IV. EXPERIMENTAL RESULTS

V. CONCLUSION

**REFERENCES**