> *Data augmentation is a technique used to artificially increase the size of a training dataset by applying transformations to existing data.*

This can be useful for machine learning tasks, especially when dealing with small or imbalanced datasets. By increasing the size and variety of the training data, data augmentation can help to improve the generalization performance of a machine learning model.

Some common Data Augmentation Techniques

1. Geometric transformations: These transformations can be used to change the spatial arrangement of the data, such as flipping, rotating, scaling, and cropping images.

2. Color transformations: These transformations can be used to change the color of the data, such as adjusting brightness, contrast, and saturation.

3. Temporal transformations: These transformations can be used to change the temporal aspects of the data, such as shifting, scaling, and warping time series data.

4. Noise injections: These transformations can be used to add noise to the data, such as Gaussian noise, salt-and-pepper noise, and speckle noise.

Some benefits of Data Augmentation

1. Improved generalization performance: By increasing the size and variety of the training

data, data augmentation can help to reduce overfitting and improve the ability of a model to generalize to unseen data.

2. Reduced sensitivity to data noise: Data augmentation can help to make models more robust to noise and variations in the input data.

3. Handling imbalanced datasets: Data augmentation can be used to increase the representation of minority classes in imbalanced datasets, improving the model's ability to classify those classes.

References:

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