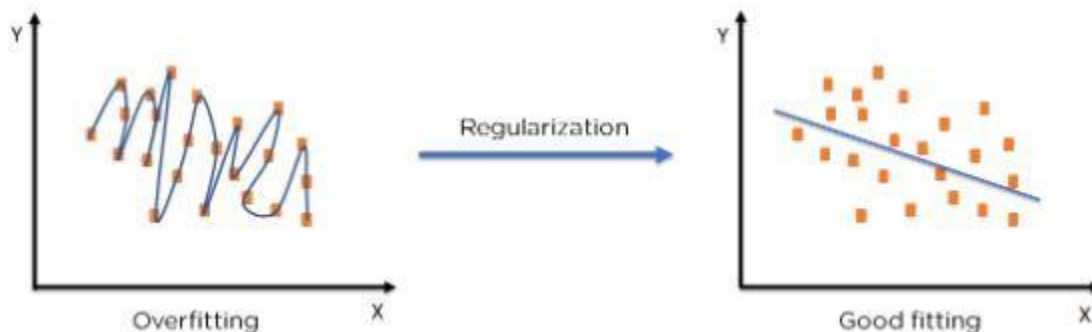# Regularization in Machine Learning: A Beginner's Guide

Regularization is a common technique used in machine learning to prevent overfitting and improve the generalization ability of a model. *Overfitting occurs when a model becomes too complex* and starts to memorize the training data, leading to poor performance on unseen data. Regularization helps to prevent this by adding a penalty term to the objective function during training.

There are two main types of regularization: L1 and L2.

L1 regularization, also known as Lasso regularization, adds a penalty term to the objective function that is proportional to the absolute value of the model weights. This has the effect of driving some of the weights towards zero, effectively removing them from the model and reducing the complexity.

L2 regularization, also known as Ridge regularization, adds a penalty term to the objective function that is proportional to the square of the model weights. This has the effect of pushing the weights towards zero, but not all the way to zero like in L1 regularization.

In both cases, the regularization term is controlled by a hyperparameter, commonly known as the regularization strength or

lambda. The higher the value of lambda, the stronger the regularization effect and the more complex the model will be. Finding the optimal value of lambda can be challenging and is often done through trial and error or using techniques such as cross-validation.

Regularization can be applied to any machine learning model, but it is particularly useful in models with a large number of parameters, such as deep learning models. In these cases, regularization can help to prevent overfitting and improve the generalization ability of the model. It is also a useful tool for selecting features in a model, as the L1 regularization will drive the weights of irrelevant features towards zero.

Summary

Overall, ***regularization is a valuable technique in machine learning that can improve the performance and generalization ability of a model.*** It is important to carefully tune the regularization strength and consider the trade-off between model complexity and regularization in order to achieve the best results.

*** Happy Learning!!!***

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For practical implementation visit my **[Github](#)** repository.

About the Author: I am Ambarish, A Data Science Enthusiast. I'm currently learning Machine Learning/Deep Learning/NLP/Computer Vision and If you have any questions please connect with me on my **[Linkedin](#)** profile.