

# **The Beginner's Guide to Unsupervised Learning in Machine Learning**

Unsupervised learning is a type of machine learning in which algorithms are used to find patterns and relationships in data without being given any labelled examples or pre-existing knowledge about the data. Unlike supervised learning, where data is labelled and the algorithm is trained to make predictions based on that labelled data, unsupervised learning relies on the algorithm to discover the underlying structure and relationships in the data on its own.

One of the key advantages of unsupervised learning is that it can be applied to vast amounts of data, even data that is not labelled or structured in any way. This makes it particularly useful for uncovering hidden patterns and relationships in data that might not be apparent to the human eye.

One of the most common applications of unsupervised learning is clustering, where the algorithm groups similar data points together into clusters. This can be useful for a variety of tasks, such as identifying customer segments in a dataset of purchase histories, or grouping images by their visual characteristics.

Another popular application of unsupervised learning is dimensionality reduction, where the algorithm seeks to reduce the number of features or variables in a dataset while retaining as much of the underlying information as possible. This can make it easier to visualize and understand the data, as well as improve the performance of supervised learning algorithms.

Overall, unsupervised learning is a powerful tool in the machine learning toolkit, offering the ability to uncover hidden patterns and relationships in data without the need for labelled examples or pre-existing knowledge. By leveraging the power of unsupervised learning algorithms, data scientists can gain valuable insights into complex and large datasets, and use those insights to make better predictions and improve decision-making.

