Assessment 2 – SIT 796

Introduction

This paper introduces machine learning and highlights the difference between its methodologies. A machine learning [1] algorithm continuously improves by encountering more data points. The following section explores three major types of machine learning algorithms.

Supervised, Unsupervised, and Reinforcement Learning

Machine learning algorithms can be differentiated based on the type of input data and the learning process adopted to develop a model. Based on this, we can categorize the algorithms into:

Supervised Learning utilizes labeled data to model a function between input data and output labels. This modeled function then predicts discrete labels (classification) or continuous values (regression) for an unseen dataset. Decision Trees and K Nearest Neighbours are examples of supervised learning.

Unsupervised Learning uses unlabelled data and finds hidden patterns that could be used to group the data into two or more subgroups. KMeans and DBScan clustering are examples of unsupervised learning.

Reinforcement Learning is an approach that teaches an agent to learn an optimal behavior in response to a presented scenario. This is done by assigning a reward or a penalty to the actions of an agent in response to a given state. This forces the agent towards choosing actions that lead to the desired response through exploration and exploitation.

Conclusion

This paper shows how the presented approaches differ from each other, supervised learning maps the input to a known label, unsupervised learning discovers association between unlabelled data, and reinforcement learning teaches an agent to behave through rewarding/penalizing of actions (trial and error).

References

[1] Mitchell, T.M., 1997. Machine learning.