Scope of machine learning

Machine learning is a field in computer science that allows computers to learn without being explicitly programmed. This can help us build systems that can respond to new situations and make predictions about what will happen next.

Machine learning has many applications including:

1. Predictive modeling: making predictions about the future based on previous data. For instance, it can predict stock prices, customer churn or sales performance.

2. Classification: identifying which class a new data point belongs to. For instance, classifying spam emails, diagnosing diseases or detecting fraud.

3. Anomaly detection: identifying data points that are different from others. For example, detecting network intrusions, faulty equipment or fraudulent transactions.

4. Recommendation systems: suggesting products to users based on their past behavior such as purchasing history or preferences etc. Thus Amazon uses machine learning for recommendations while Netflix uses it for movie recommendations and Spotify also relies on them to recommend music.

Limitations of machine learning

In spite of its many successes, machine learning does have some limitations.

Some of these limitations include;

1. Data dependency: A machine learning model is only as good as the data it was trained on. If the data is incomplete or biased so will be the model.

2. Lack of interpretability: Many machine learning models especially deep learning models are difficult to interpret. In this case it is hard to know why a certain decision was made by the model.

3. Overfitting: Machine Learning models may overfit their training data which means they do not perform well when applied with new data.

4. Computational cost: Training machine learning models can be computationally expensive especially with large datasets.

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- “Machine Learning: A Practical Guide” by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani

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