

# CS – Machine Learning

# Overview

- Challenges in Machine Learning
- Applications of Machine Learning

# Challenges in Machine Learning

# Challenges in Machine Learning

## 1. Data Collection

- Machine learning is all about data. We cannot apply machine learning techniques if we have no data.
- Data can be collected from APIs or using Web Scrapping.

## 2. Insufficient Data/ Labelled Data

- Provided data is not enough.
- Data is not properly labelled.

## 3. Poor Quality Data

- So many outliers in the data.
- So many missing values.
- Irrelevant values.

# Challenges in Machine Learning

## 4. Irrelevant features

- If some data or columns are irrelevant in the dataset, remove those data.

## 5. Overfitting

- Overfitting in machine learning is when a model learns the training data too well, including its noise and errors, making it perform poorly on new data.

## 6. Underfitting

- Underfitting is when a model is too simple to capture the underlying patterns in the data, resulting in poor performance on both the training data and new, unseen data.

# Applications of Machine Learning

# Applications of Machine Learning

## 1. Retail - Amazon

- If some data or columns are irrelevant in the dataset, remove



# Applications of Machine Learning

## 2. Banking and Finance

- Customer profile is evaluated before a loan is granted.





# Applications of Machine Learning

## 3. Manufacturing - Tesla

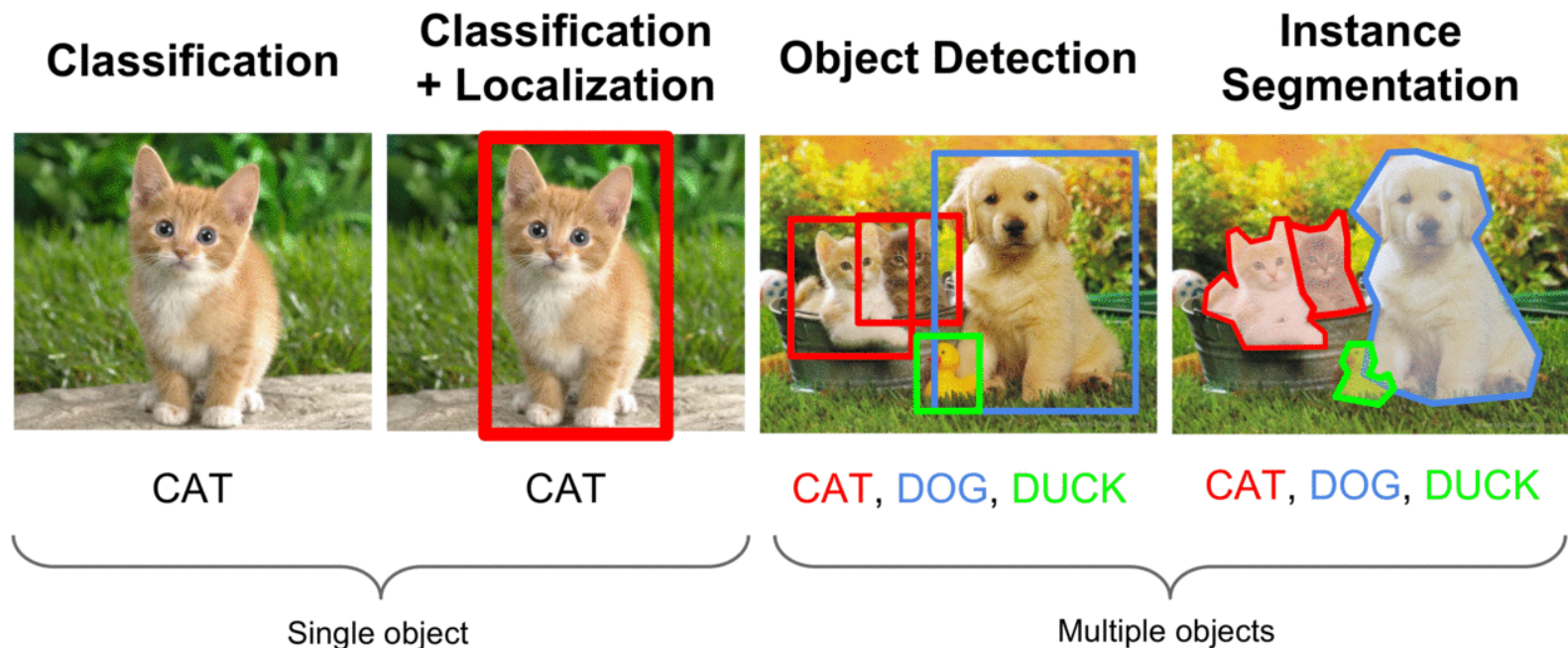
- Self-driving cars



# Applications of Machine Learning

## 4. Image Recognition

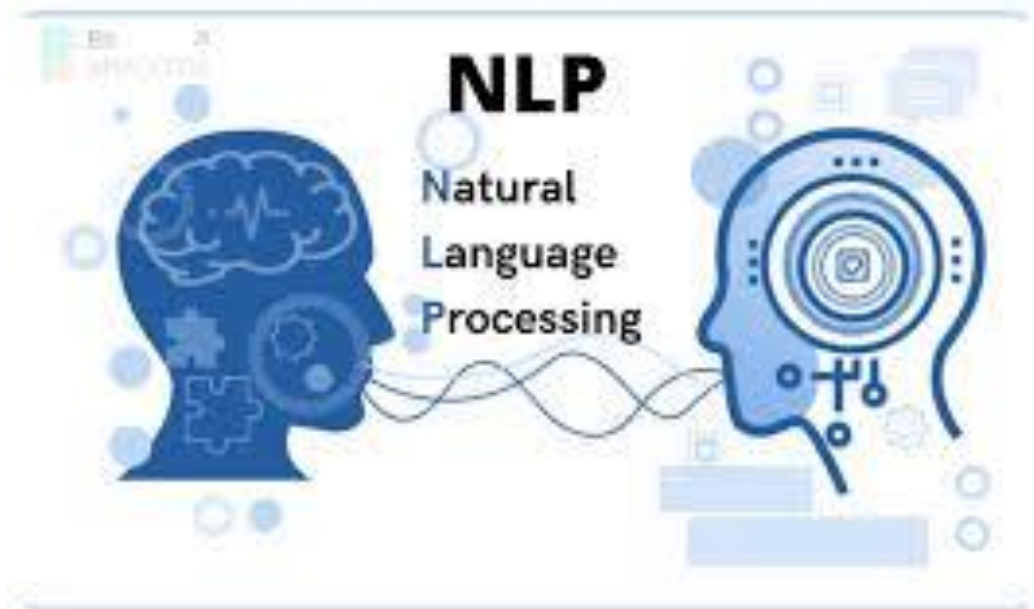
Machine learning algorithms are extensively used for image recognition tasks, such as identifying objects, faces, and patterns in images. This technology is employed in social media platforms like Facebook and Instagram for tagging and categorizing photos.



# Applications of Machine Learning

## 5. Natural Language Processing (NLP)

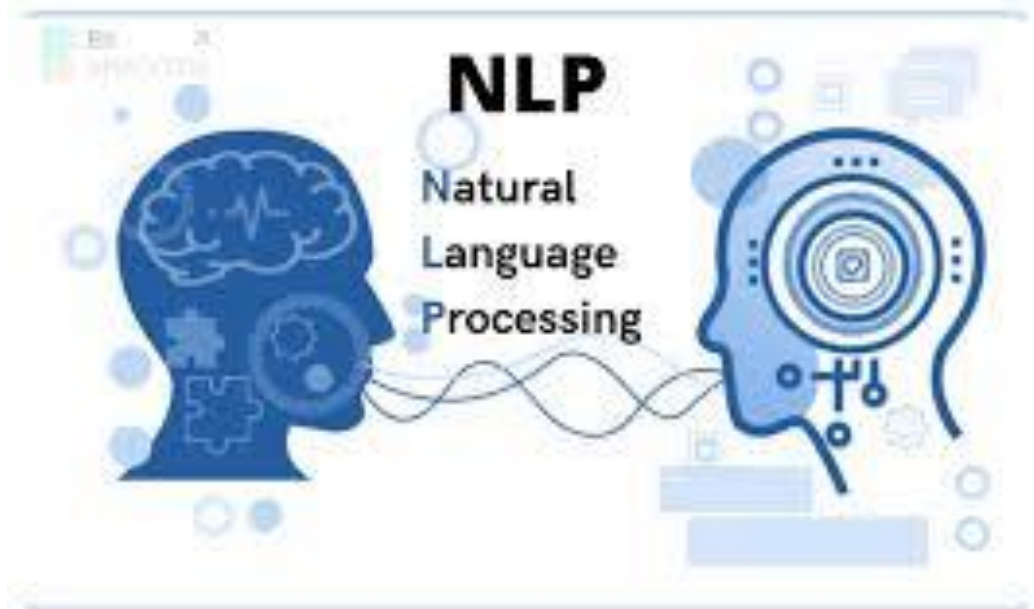
NLP applications include chatbots and virtual assistants like Siri and Alexa, which utilize ML to understand and respond to human language. These systems learn from user interactions to improve their responses over time.



# Applications of Machine Learning

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# Applications of Machine Learning

## 5. Recommendation Systems

E-commerce platforms like Amazon and streaming services like Netflix use machine learning to analyze user behavior and preferences, providing personalized product or content recommendations.

# Applications of Machine Learning

## 6. Fraud Detection

In finance, machine learning algorithms analyze transaction patterns to detect fraudulent activities in real-time. This application is crucial for banks and credit card companies to prevent financial losses.

# Applications of Machine Learning

## **7. Predictive Analytics**

Businesses utilize ML for predictive analytics to forecast trends and consumer behavior based on historical data. This application is widely used in marketing strategies and inventory management.

# Applications of Machine Learning

## 8. Healthcare Diagnostics

Machine learning aids in diagnosing medical conditions by analyzing patient data and medical images. For instance, it can help identify cancerous growths in scans, improving diagnostic accuracy.



# Applications of Machine Learning

## 9. Spam Filtering

Email services use machine learning algorithms to filter out spam messages by analyzing the characteristics of incoming emails.

# Applications of Machine Learning

## **10. Speech Recognition**

Applications like Google Assistant use ML for speech recognition, converting spoken language into text and enabling voice commands.

Have a Good Day!