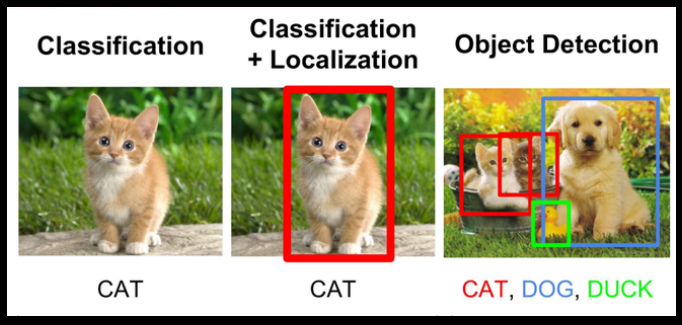
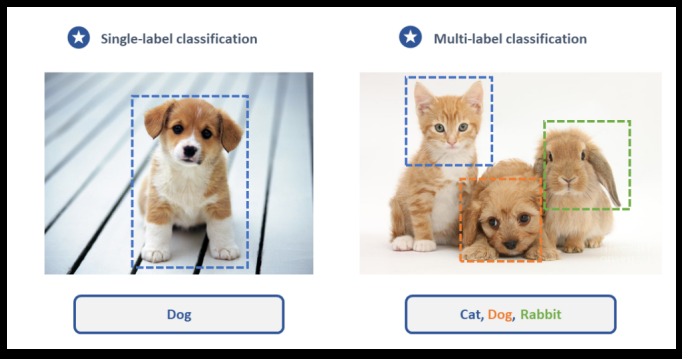
Image classification is a fundamental task in computer vision where an algorithm assigns a label or category to an input image. This process involves training a deep learning model, often a convolutional neural network (CNN), to recognise patterns and features in images to classify them into predefined categories.



Algorithm ⟶ CNN Model
↓
Image ⟶ Label / Class
Model ⟶ Features / Patterns



What is the object?
Cat / Dog
Single Label / Multi Label

Competitions:

- ImageNet Large Scale Visual Recognition Challenge (ILSVRC)
- Kaggle Competitions
- Google Landmark Recognition Challenge

Popular Datasets:

- ImageNet – Contains over 14 million images across 1,000 categories.
- CIFAR-10 & CIFAR-100 – Small-scale datasets with 10 and 100 classes, respectively.
- MNIST – Handwritten digits dataset (0-9) for basic classification tasks.
- Fashion-MNIST – Clothing and fashion-related dataset with 10 classes.
- COCO – Though primarily used for object detection, it can also be used for classification.
- OpenImages – A large-scale dataset from Google with diverse images and labels.

Metrics in Image Classification

1. Accuracy
2. Precision
3. Recall
4. F1 Score
5. Top 1 Accuracy
6. Top 5 Accuracy

Loss Function :— Log loss
Cross Entropy Loss

Models

1. LeNet
2. Alexnet
3. VGG
4. GoogleNet
5. Resnet
6. DenseNet
7. Squeeze Net
8. Efficienet