

Convolutional Neural Networks (CNNs) are a special type of neural network designed to process visual data like images. They work by using convolutional layers that automatically detect patterns such as edges, shapes, or textures by scanning across the image with small filters (kernels). These features are then passed through pooling layers to reduce dimensionality and finally into fully connected layers for classification.

CNNs are widely used in computer vision tasks such as object detection, image recognition (like CIFAR-10), and medical image analysis. They outperform traditional neural networks on image data because they preserve spatial relationships and require fewer parameters.

**Gotchas:** CNNs need a large amount of data and computational power. They're also sensitive to input image size and may overfit if not regularized properly using techniques like dropout or data augmentation.

[CNN CIFAR10 Week12.ipynb - Colab](#)