# Types of Neural Networks

Exploring different architectures for various data types and applications

Standard

CNN

RNN

LSTM/GRU

Hybrid

# Standard Neural Networks

## Ideal for structured data applications

### Common Applications

- Real Estate
- Online Advertising

### Data Type

Suitable for handling **structured data** that is relatively simple

# Convolutional Neural Networks

## Specialized for image processing

### Image-Based Applications

CNNs are **excellent for handling images** because they can recognize patterns and features within them

#### Edge Detection

Identifies boundaries and contours in images

#### Shape Recognition

Detects geometric patterns and structures

#### Feature Extraction

Automatically learns important visual features

# Sequential Data

## Data with temporal elements

### What is Sequential Data?

Data that has a **temporal element** where order matters

### Audio

Unfolds over time, making it a **one-dimensional time series**

### Language

Characters or words that **follow one another sequentially** (English, Chinese, etc.)

# Recurrent Neural Networks

## Processing sequential information

### Sequential Data Processing

RNNs can handle information in **sequence** while maintaining **temporal context**

### LSTM

Long Short-Term Memory networks improve performance on **long sequences**

### GRU

Gated Recurrent Units handle **complex sequences** with simplified architecture

# Hybrid Networks

## Processing multiple data types simultaneously

### Advanced Applications

In highly advanced applications, such as **self-driving cars**, it may be necessary to process multiple types of data simultaneously

- Images
- Radar Information

### CNN Integration

Combining **CNNs for image processing** with other methods for handling different sensory data

### Specialized Capabilities

Making the network more **specialized** and capable of managing all inputs effectively