WebAPI

Timeline

1. ANN - Artificial Neural Network - Base Network
2. CNN - Convolutional Neural Network
3. RNN Recurrent Neural Network
4. GAN - Generative Adversarial Neural Network
5. RL - Reinforcement Learning

Certainly! Let’s break down the full forms and meanings of these neural network types:

1. **Artificial Neural Network (ANN)**:
   * An ANN is a type of neural network that mimics the structure of the human brain. It consists of interconnected nodes (artificial neurons) organized into layers.
   * **Feed-Forward**: Information flows from one layer to another without touching a node twice. This type of network recognizes patterns in raw data and helps solve complex problems.
   * **Use Cases**:
     + Predictive analysis for business intelligence.
     + Speech-to-text transcription applications.
     + Handwriting and facial recognition.
     + Spam email detection.
     + [Weather prediction1](https://levity.ai/blog/neural-networks-cnn-ann-rnn)[2](https://www.analyticsvidhya.com/blog/2020/02/cnn-vs-rnn-vs-mlp-analyzing-3-types-of-neural-networks-in-deep-learning/).
2. **Convolutional Neural Network (CNN)**:
   * A CNN is designed for processing grid-like data, such as images. It uses convolutional layers to automatically and adaptively learn patterns from data.
   * **Convolutional Layers**: These layers apply filters (kernels) to input data, capturing local patterns and features.
   * **Use Cases**:
     + Image classification (e.g., identifying objects in photos).
     + Object detection (finding specific objects within an image).
     + Facial recognition.
     + Medical image analysis.
     + [Natural language processing (when combined with recurrent layers)1](https://levity.ai/blog/neural-networks-cnn-ann-rnn).
3. **Recurrent Neural Network (RNN)**: 1987
   * An RNN is suitable for **sequential data**, where the order matters (e.g., time series, natural language).
   * **Feedback Loop**: RNNs have connections that allow information to persist across different time steps.
   * **Use Cases**:
     + Natural language processing (language modeling, machine translation).
     + Speech recognition.
     + Music generation.
     + Video analysis.
     + [Time series prediction1](https://levity.ai/blog/neural-networks-cnn-ann-rnn)[3](https://www.geeksforgeeks.org/difference-between-ann-cnn-and-rnn/).
4. **Generative Adversarial Network (GAN)**:
   * A GAN consists of two neural networks: a generator and a discriminator.
   * **Generator**: Creates new data (e.g., images) from random noise.
   * **Discriminator**: Distinguishes between real and generated data.
   * **Use Cases**:
     + Image generation (e.g., creating realistic faces, artwork).
     + Style transfer.
     + Data augmentation.
     + [Anomaly detection1](https://levity.ai/blog/neural-networks-cnn-ann-rnn).
5. **Reinforcement Learning (RL)**:
   * RL is a type of machine learning where an agent learns to make decisions by interacting with an environment.
   * **Agent**: Learns from rewards or penalties received based on its actions.
   * **Use Cases**:
     + Game playing (e.g., AlphaGo, chess).
     + Robotics (learning to control robotic arms).
     + Autonomous vehicles.
     + Recommendation systems.
     + [Financial trading1](https://levity.ai/blog/neural-networks-cnn-ann-rnn).

Remember that each type of neural network has its own strengths and weaknesses, and choosing the right one depends on the problem you’re trying to solve! [😊1](https://levity.ai/blog/neural-networks-cnn-ann-rnn)[2](https://www.analyticsvidhya.com/blog/2020/02/cnn-vs-rnn-vs-mlp-analyzing-3-types-of-neural-networks-in-deep-learning/)[3](https://www.geeksforgeeks.org/difference-between-ann-cnn-and-rnn/)

ANN is base unit of Deep Learning



**Data Types**

1. Structured
2. Unstructured

| RNN, LSTM, GRN, Attestation | Transformer, ULMFIT |
| --- | --- |
| Sequence | Parallel |
| Large/largeer - x | Large/larger - OK |
| Huge data X | Huge data - OK |
| RNN, LSTM | Self Attestating, NN Embedding |

Transfer Learning /

Computer Vision NLP

Image classification Text classification

Object Detection Generation

Sequence Q/A