Neural Networks – Final Remarks

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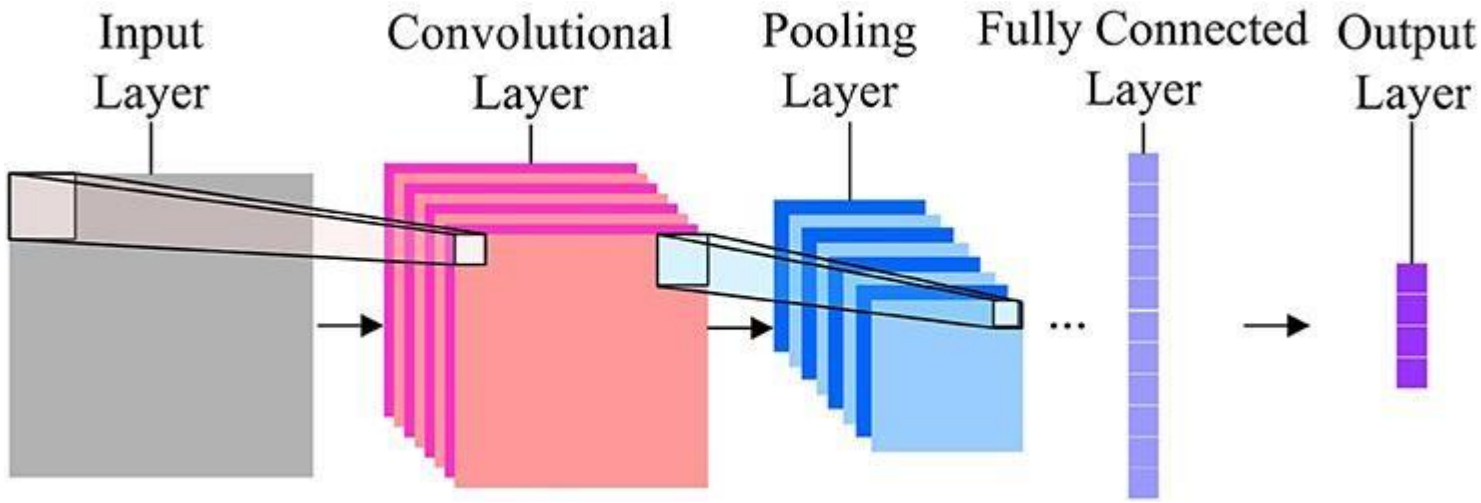
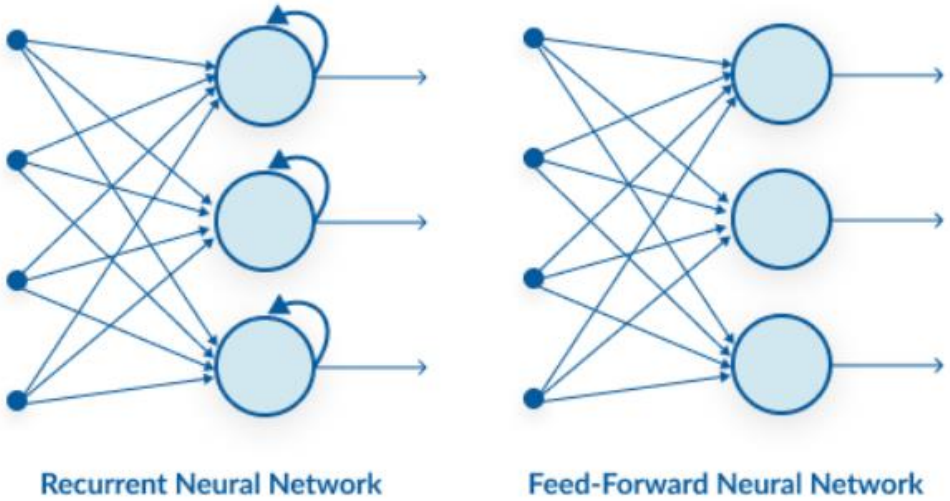
Types of Neural Networks



Convolutional Neural Network



Supervised Learning

Input	Output	Application
Home Features	Price	Real Estate
Ad, User Features	Click on Ad (0/1)	Online Advertising
Image	Objects	Photo Tagging
Audio	Text Transcription	Speech Recognition
English	Urdu	Machine Translation
Image, Radar Info	Position of other Cars	Autonomous Driving

Applications of Deep Learning

- Text Generation (ChatGPT/Bard)
- Image Generation (Midjourney) / Deep Fake Audio/Videos
- News Aggregation and Fraud News Detection
- Virtual Assistants
- Entertainment
- Healthcare
- Image Colorization
- Question Answering
- And many more …

Deep Learning and Neural Networks

- **Strengths**
  - Ability to learn complex relationships and performs quite well for unstructured data such as text and images
  - End-to-End Learning – Representation Learning – no need to engineer features
  - Transfer Learning – leverage the knowledge from one task and use it for other downstream tasks.

- **Weakness**
  - It requires a lot of data to perform well
  - The training is computationally expensive and may take a lot of time (depending on the size of the dataset)
  - Interpretability