CNN

Application:

1. Sentiment prediction
2. Query documents matching
3. Question type classification
4. Short text categorization
5. Sarcasm detection

Shortcoming:

Lack of Long-Distance Dependencies

Advantage:

Memorize previous computations, very different aspects of data.

RNN

Overcome gradient vanishing problem: LSTM, ResNets, GRU

Application:

1. Word level classification
2. Sentence level classification (e.g. sentiment polarity)
3. Semantic matching
4. NLP generation

Attention Mechanism:

Machine translation, Visual Q&A, Image captioning

Recursive NN

RNTN, MV-RNN

Application:

1. Parsing
2. Leveraging phrase-level representations for sentiment analysis
3. Semantic relations classification (e.g. giving a topic -> message)
4. Sentence relatedness

Reinforcement Learning

Application:

1. Text summarization
2. Image captioning
3. Machine translation

BERT

Bidirectional Encoder Representations from Transformers pretrained by Google.

Application:

1. General Language Understanding Evaluation
2. Stanford Question Answering
3. Situations with Adversarial Generations

For language understnding