

# NLP Evolution: From Rules to Neural Networks

## Rule-Based Systems

Hand-crafted rules & feature engineering

## RNN & LSTM

Sequential processing with memory

## Seq2Seq Models

Encoder-decoder for translation

## Word Embeddings

Word2Vec, GloVe semantic relationships

## Attention Mechanism

Dynamic focus on relevant parts

## Next Generation →

Transfer learning & deep context

### ⚠ Limitations

Shallow representations • Task-specific training

### The Need

Better context understanding • Transfer learning capabilities