

Advances in Large Language Models

Abstract

This paper surveys recent advances in large language models (LLMs) and their applications in natural language processing tasks.

1. Introduction

Large language models have revolutionized NLP since the introduction of the Transformer architecture in 2017. Key developments include:

- GPT series: Autoregressive language modeling
- BERT: Bidirectional encoder representations
- T5: Text-to-text transfer learning

2. Methodology

Modern LLMs typically employ:

- Self-attention mechanisms for context understanding
- Massive parameter counts (billions of parameters)
- Pre-training on large text corpora

3. Results

State-of-the-art results achieved on:

- Question answering: 92.4% accuracy

- Text summarization: 45.2 ROUGE-L score
- Machine translation: 38.6 BLEU score

4. Conclusion

LLMs continue to advance rapidly, with emerging capabilities in reasoning, code generation, and multimodal understanding.