**Transformer Neural Networks**

Transformer neural networks, a pioneering invention in the field of artificial intelligence, have revolutionized how computers understand and generate human language. Think of a highly efficient librarian who can not only understand and categorize millions of books instantly but also create new stories by understanding the essence of all the books they've read. That gives an idea as to what transformers do with data.

Basic to transformers is the concept of "attention mechanisms." These mechanisms enable the model to focus on different parts of the input data, much like how we pay more attention to specific words or phrases when trying to understand a sentence or a paragraph. This focus allows transformers to grasp the context and nuances of language far better than their predecessors.

Transformers are designed to handle sequential data, such as text or time series, but unlike older models that process data in order, transformers can look at all parts of the data simultaneously. This ability not only improves their understanding but also significantly speeds up their training and operation.

A famous example of a transformer-based model is OpenAI's GPT (Generative Pretrained Transformer) series. These models can generate human-like text, answer questions, summarize long articles, translate languages, and even create content that feels surprisingly human.

The impact of transformers extends beyond natural language processing. They are also being adapted for tasks in computer vision, such as image recognition, and in other domains requiring analysis of sequential data, such as Time Series Analysis in finance, healthcare, and meteorology as well as Audio Processing, Genomics and Signal Processing (EEG, seismic data). Their versatility and efficiency make them a cornerstone of modern AI development, pushing the boundaries of what machines can understand and create.

Referencs:  
  
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