Semantic similarity in the context of Natural Language Processing (NLP) refers to the process of determining how similar two pieces of text are in terms of their meaning. Unlike lexical similarity, which focuses on the similarity of the words themselves (e.g., synonyms), semantic similarity takes into account the context and the overall meaning conveyed by the text, recognizing that words can have different meanings in different contexts.

There are various approaches and models used to measure semantic similarity, including:

1. **Vector Space Models:** These represent words or text snippets as vectors in a high-dimensional space, where the distance or angle between vectors indicates their semantic similarity. Techniques such as TF-IDF (Term Frequency-Inverse Document Frequency) and word embeddings like Word2Vec, GloVe, and FastText are commonly used.

1. **Neural Network Models**: Deep learning models, particularly those based on the transformer architecture like BERT (Bidirectional Encoder Representations from Transformers), GPT (Generative Pre-trained Transformer), and their derivatives, are highly effective at capturing semantic meanings and nuances. They can understand the context of words in sentences to a remarkable degree, making them powerful tools for semantic similarity tasks.

3. **Ontological Models**: These involve using structured knowledge bases or ontologies (like WordNet for English) that define the relationships between words in terms of semantics. Such models can be used to compute semantic similarity by analyzing the paths and connections between concepts within these structures.

4. **Hybrid Models**: Combining various approaches, such as vector space models with ontological or contextual information, to improve the understanding and representation of semantic similarity.

Applications of semantic similarity in NLP include but are not limited to:

- **Information Retrieval**: Enhancing search engines to return results that are semantically related to the query, even if the exact words are not used.

- **Text Summarization**: Generating concise summaries that capture the semantic essence of longer texts.

- **Question Answering**: Finding the most relevant answers to questions by comparing the semantic similarity between the question and potential answers.

- **Text Clustering**: Grouping together texts that are semantically similar for classification, organization, or thematic analysis.

Semantic similarity is a crucial concept in NLP, enabling more intuitive, flexible, and effective interaction between humans and computers by focusing on the meaning of language rather than just the surface-level words.