

Natural Language Processing Advancements By Deep Learning: A Survey

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The process of transferring the knowledge of human-level understanding of human interactions into a machine is the concept of Natural Language Processing. Human interactions hold huge information, involving various topics, tones, words, emotions, given that the interpretation differs vastly according to the geographical location and culture, thus resulting in a massive amount of data. This set of unstructured/unlabeled data are difficult to be processed by machines, requires extensive efforts and varied models.

Some of the conventional machine learning models like Naïve Bayes, decision tree along with BOW, n-grams, etc. were used to seize this problem but with unexceptional results. The state-of-art deep learning models attempt to overcome this complication. This survey discusses the state-of-art deep learning models to perform multiple elemental tasks in NLP, benchmark datasets used for these distinctive tasks, the evaluation metrics to assess the models used and provide a comparative study of different models.

The fundamental tasks in NLP are Parts-of-speech tagging, parsing, semantic role labeling which use Meta-BiLSTM, Self-Attentive Encoder and Argumented Representations with BiLSTM are used respectively to achieve the highest accuracies. The secondary tasks like Text classification, Information Extraction, Sentiment Analysis, Machine Translation use ULMFit, Contextual String Embeddings, BERT, Back-translation respectively for precise results. The study of each task and the corresponding state-of-art model, in detail, will be explored further in the article.