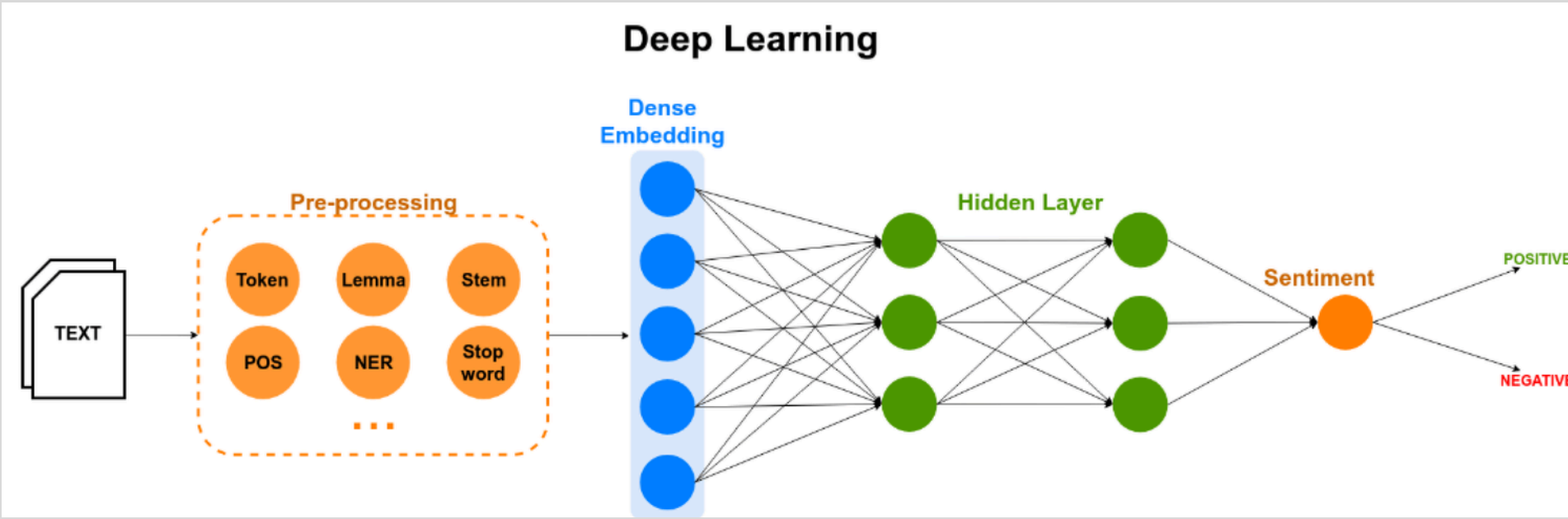
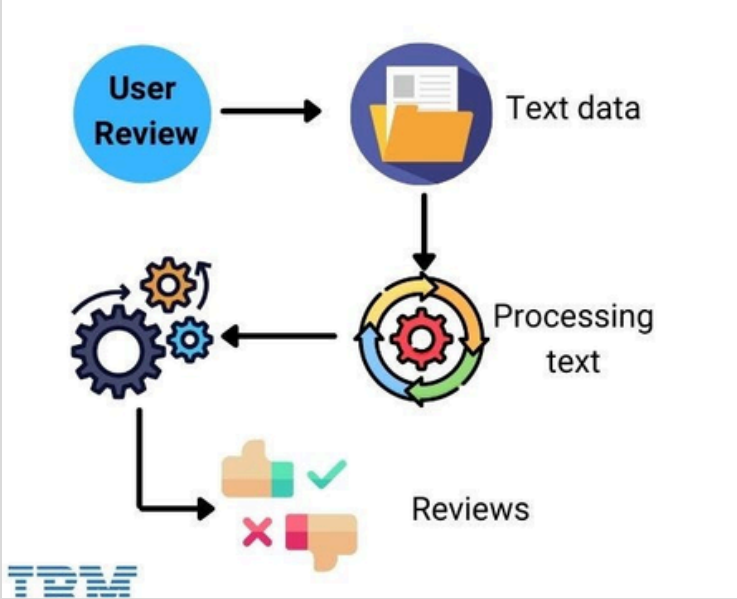


Introduction

Sentiment analysis is a key task in NLP that aims to determine the emotional tone behind text. This study focuses on classifying IMDB movie reviews as positive or negative using a Long Short-Term Memory (LSTM) model, which captures long-range dependencies in language. LSTMs are effective for understanding sequential text data, making them suitable for sentiment classification tasks.

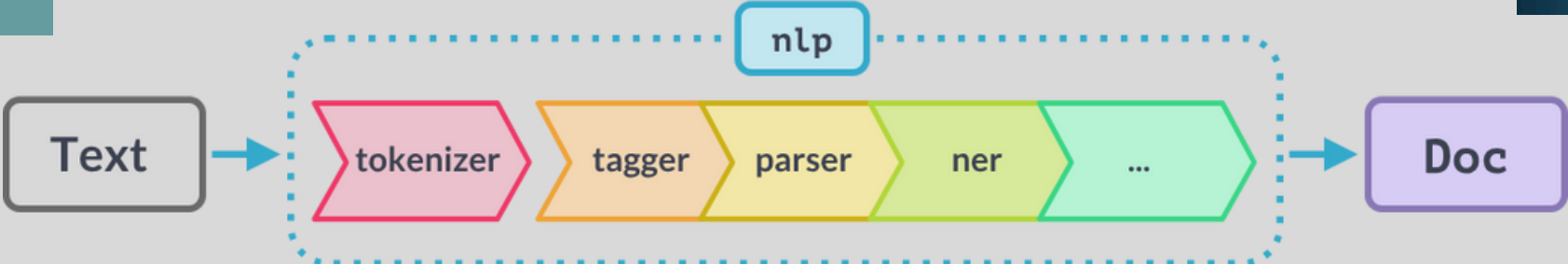


MOTIVATIONS	METHODOLOGY	RESULTS
Movie reviews often contain nuanced expressions, sarcasm, and long-term dependencies that traditional models struggle to interpret. Capturing contextual meaning in such texts remains a challenge for accurate sentiment classification.	<ul style="list-style-type: none">Data Preprocessing: Cleaning, stopword removal, and tokenization.Embedding Layer: Initialized with 100-dimensional GloVe vectors.Model Architecture: LSTM layer followed by a dense output layer.Training: Used padded sequences with a max length of 100 tokens.	<ul style="list-style-type: none">Dataset: IMDB movie reviews (25,000 training & 25,000 testing samples).Accuracy: Achieved 88.5% accuracy on test data.Observation: LSTM effectively captured context and sentiment compared to simpler models.

Contributions



- Developed an LSTM-based model for binary sentiment classification on the IMDB dataset.
- Integrated pre-trained GloVe word embeddings to improve contextual understanding.
- Achieved high accuracy by fine-tuning hyperparameters and sequence padding strategies.



Conclusion

LSTM models effectively capture long-term dependencies in text, making them well-suited for sentiment analysis. Our approach, enhanced by GloVe embeddings, achieved 88.5% accuracy on the IMDB dataset, confirming the strength of LSTM in handling complex movie reviews. Future improvements can include attention mechanisms or transformer-based architectures for even better performance.

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