

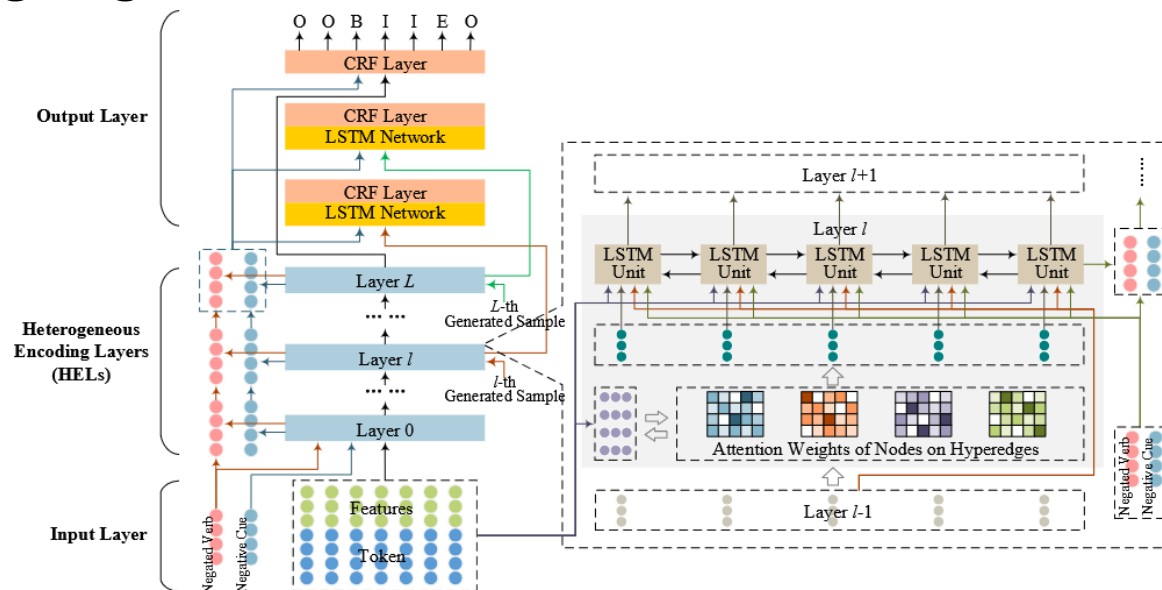
Negative Focus Detection via Hypergraph Attention LSTM Network and LLM-Driven Data Augmentation

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Problems & Ideas

- Problems of Negative Focus Detection (NFD) approaches:
 - Data limitation of universally accepted NFD corpora.
 - Coarse-grained task-specific encoder.
 - Insufficient sequential dependencies of words.
- Ideas: LLM-Driven Data Augmentation & HyperGraph attention LSTM network (LSTM-HyG) to study interactions among negative verbs, cues, focuses, and sentences.

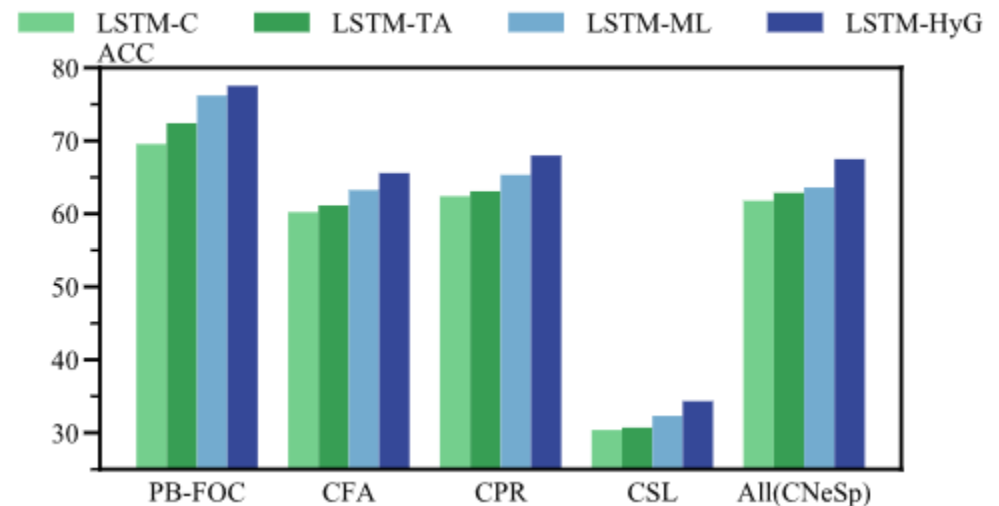


The architecture of the proposed HyperGraph attention LSTM (LSTM-HyG) network, including Input Layer, Heterogeneous Encoding Layers (HELs), and Output Layer, where HEL is composed of HyperGraph Attention network (HyGAT) and LSTM Variant Network

Main Contributions

- Contributions:
 - We exploit Large Language Models (LLMs) to produce more meaningful samples of the benchmark corpus;
 - We develop a complicated model assembled with hypergraph attention networks and LSTM variants to study interactions among negated verbs, negative cues, negative focuses;
 - We regard NFD as a sequence labelling task, and apply a more precise label scheme.

Models	PB-FOC	CNeSp			
		CFA	CPR	CSL	ALL
LSTM-ML	75.70	62.95	64.03	33.31	63.60
Sgl	79.17	41.80	67.93	40.00	64.85
Cue	73.51	-	-	-	-
Oth	75.87	64.56	63.18	29.54	63.36
LSTM-HyG					
TKR-DA	73.88	61.22	64.27	33.20	62.51
Sgl	72.92	41.58	68.03	30.00	64.82
Cue	73.51	-	-	-	-
Oth	74.25	62.73	63.30	33.60	62.05
LLM-DA	77.53	65.58	67.98	34.33	67.49
Sgl	78.13	45.97	71.21	20.00	68.05
Cue	76.76	-	-	-	-
Oth	77.73	67.06	67.16	35.36	66.02



Left: Performance of our LSTM-HyG model and the most competitive baseline. Right: Performance of LSTM models on NFD task when applying LLM-driven data augmentation.