AI-based Stock Market Trending Analysis
Project ID: SCSE19-0125

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Aim & Methodology

Our objective for this research is to utilise hierarchical learning for market index trend predictions. We will design 2 hierarchical models (Hierarchical NLP and Hierarchical LSTM models) and pit it against the industrial standard model, ARIMA.

We designed and developed two hierarchical neural networks for market trends predictions. The hierarchical NLP model used a FastText architecture while the hierarchical LSTM was implemented in Keras. These models performed supervised hierarchical learning to predict the next day trend (i.e. bullish, stagnant, bearish). The hierarchical models were trained in the context of swing trading of 2 days using price actions of Dow Jones Industrial Average (Ticker: DJI). The hold-out method was used to validate the training.
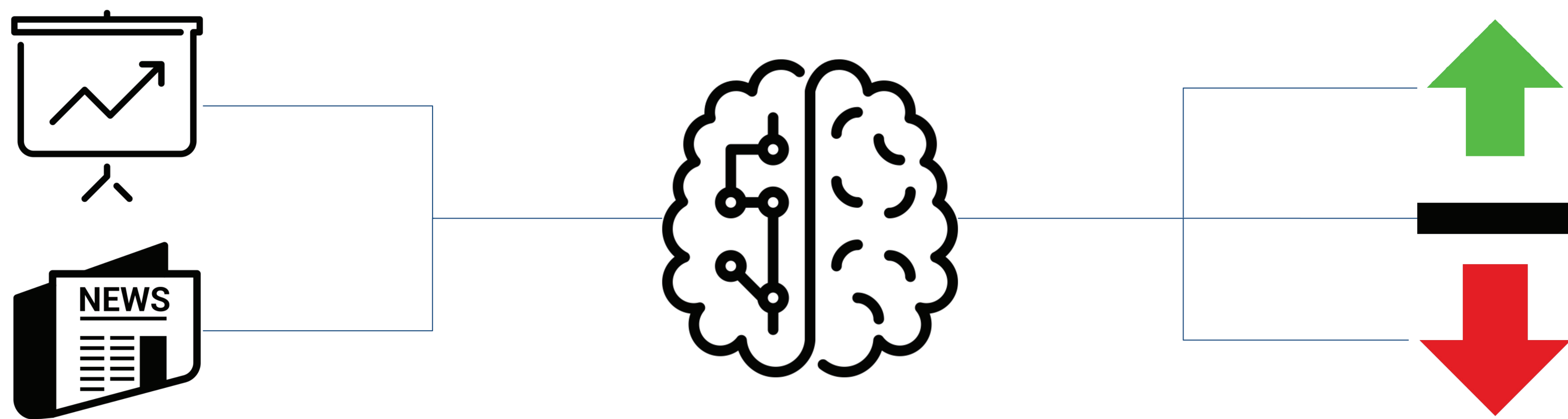
Aim & Methodology

The hierarchical LSTM model had the best overall performance by achieving the highest F1 score while having a short training time.

Test	Models		
	HNLP	**HLSTM**	**ARIMA**
1	0.471	0.526	0.211
2	0.482	0.469	0.210
3	0.469	0.424	0,210
4	0.468	0.522	0.207
5	0.478	0.459	0.211

Table 1: F1 scores

Models	Training time
HNLP	1hr 4mins 7seconds
HLSTM	15mins 7seconds
ARIMA	1min 1seconds

Table 2: Training time