

SCSE21007 – Granular and Explicit Financial Sentiment Analysis

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Motivation

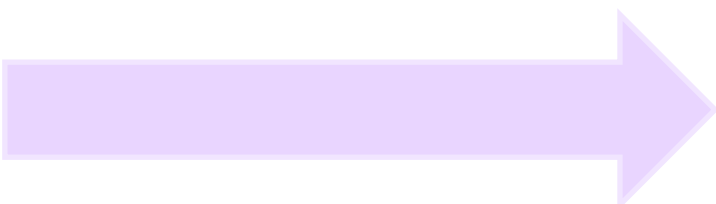
Sentiment Analysis (SA) is a powerful tool with widespread applications, such as in the investment sector. Investors and traders often want to analyze the sentiments towards a particular stock to make more intelligent investment decisions. Current solutions lack the **granularity** and **explicitness**, meaning they inherently do not allow users to choose the exact entity they are interested in during inference time. This research aims to tackle this problem.

Methodology

Input Sentence:

Ford dives due to poor sales, but potential cash inflows send **Tesla** stock surging

Input aspects: **Ford, Tesla**



EATSA

Output:

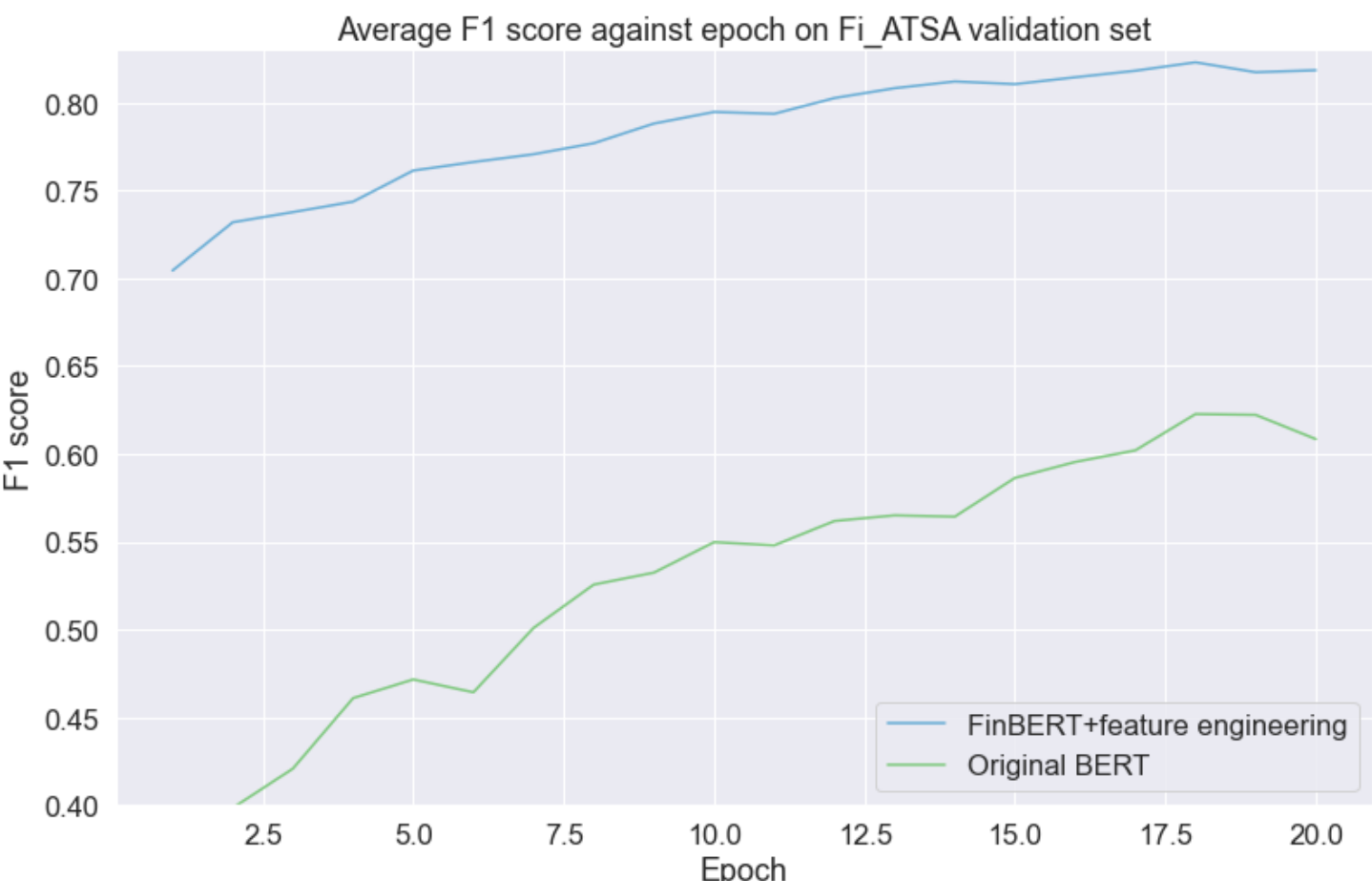
Ford -> **Negative**
Tesla -> **Positive**

Explicit Aspect Term Sentiment Analysis (EATSA), is a simplification of Aspect Term Sentiment Analysis(ATSA). It replaces the aspect extraction phase of ATSA with string matching and keeps the aspect sentiment prediction phase. This simplification is reasonable in applications where the aspects words (e.g Ford, Tesla etc.) are expected to be mostly consistent and unambiguous. The main benefit is that users can explicitly choose their desired aspects during inference time, offering more user control. Also, simplifying the task reduces computational need during both training and deployment.

Method	Prediction	Pros	Cons
Traditional Sentiment Analysis	Positive		<ul style="list-style-type: none"> Lacks granularity
Traditional Aspect Term Sentiment Analysis	Prediction: Ford -> Negative Tesla ->Positive	<ul style="list-style-type: none"> Granular No word ambiguation – ATSA can handle words with different meanings 	<ul style="list-style-type: none"> Lacks explicitness – model pipeline inherently does not allow users to choose aspects at inference time Greater computation
Explicit Aspect Term Sentiment Analysis	Prediction: Ford -> Negative Tesla -> Positive	<ul style="list-style-type: none"> Granular Explicit Reduced computation 	<ul style="list-style-type: none"> Word ambiguation – EATSA cannot differentiate words with different meanings

Findings

Our prototype utilizes FinBERT and neural network classifier. We evaluate our model on a Fi_ATSA dataset, a manually labelled financial dataset for EATSA. Through domain adaptation and feature engineering, we found large performance gains, as shown on the next plot.



Conclusion

There are potential performance gains and benefits in simplifying ATSA into EATSA in some applications. Future research can explore data augmentation techniques to increase training data quantity, which is a real problem in practice.