INForex: Interactive News Digest for Forex Investors

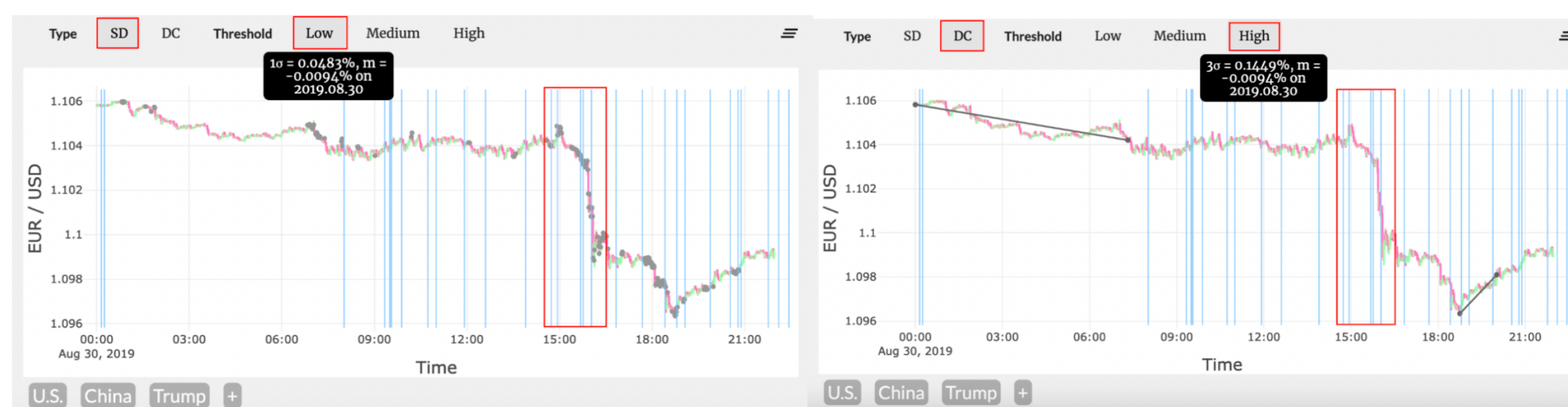Chih-Hen Lee, Yi-Shyuan Chiang, Chuan-Ju Wang   Academia Sinica, Taipei, Taiwan

1. Abstract

As foreign exchange (Forex) markets reflect real-world events, locally or globally, financial news is often leveraged to predict Forex trends. In this demonstration, we propose INForex, an interactive web-based system that displays a Forex plot alongside related financial news. To our best knowledge, this is the first system to successfully align the presentation of two types of timeseries data—Forex data and textual news data—in a unified and time-aware manner and as well as the first Forex-related online system leveraging deep learning techniques. The system can be of great help in revealing valuable insights and relations between the two types of data and is thus valuable for decision making not only for professional financial analysts or traders but also for common investors. The system is available online at http://cfda.csie.org/forex/, and the introduction video is at https://youtu.be/ZhFqQamTFY0.

2. Event Detection Algorithms

SD events indicate time points during which the Forex prices dramatically change. It is based on the standard deviation of Forex price differences.
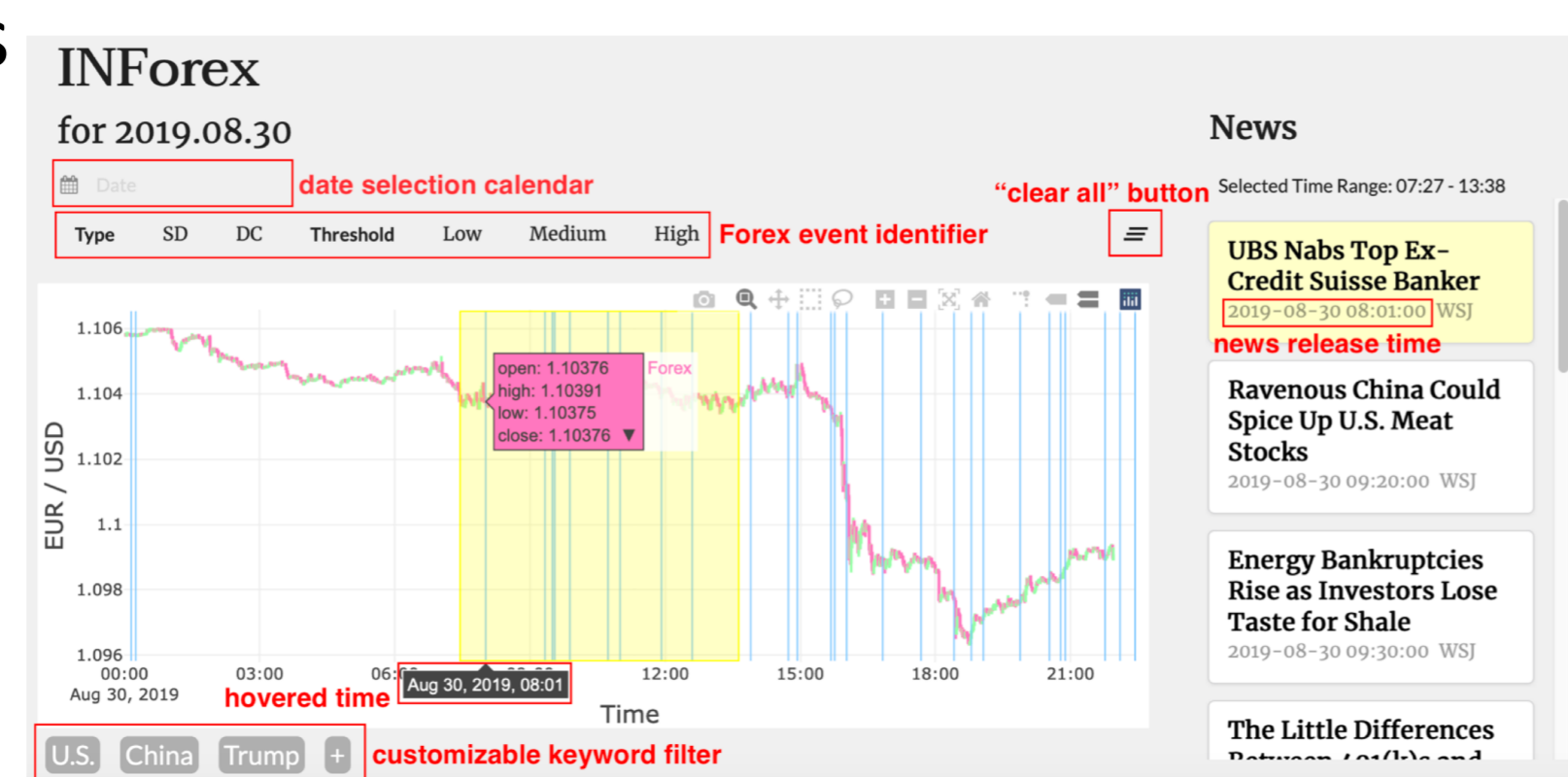

DC events show time points where the trends of Forex prices change. The market is summarized into a set of uptrend and downtrend events.

3. Interfaces and features

Interactive Forex Chart
Forex prices are displayed by a standard candlestick chart. Users can specify the date with the calendar icon above the chart. The blue vertical lines correspond to the news story release time points. As shown in the figure, the corresponding news in the right panel is highlighted if users hover over the corresponding blue line on the chart. Moreover, users can easily select specific time ranges by single-clicking the start and end points of a period on the Forex chart (resulting in the yellow span in the figure); the news section in the right panel changes correspondingly.

Forex Event Identifier
Users specify event types and the corresponding thresholds with the Forex event identifier, after which the algorithm output is shown on the Forex chart as gray dots for the SD events and span lines for the DC events. Note that once done with a specific setting, users clear the setting with the "clear all" button on the top-right of the left panel; a higher threshold locates fewer events.
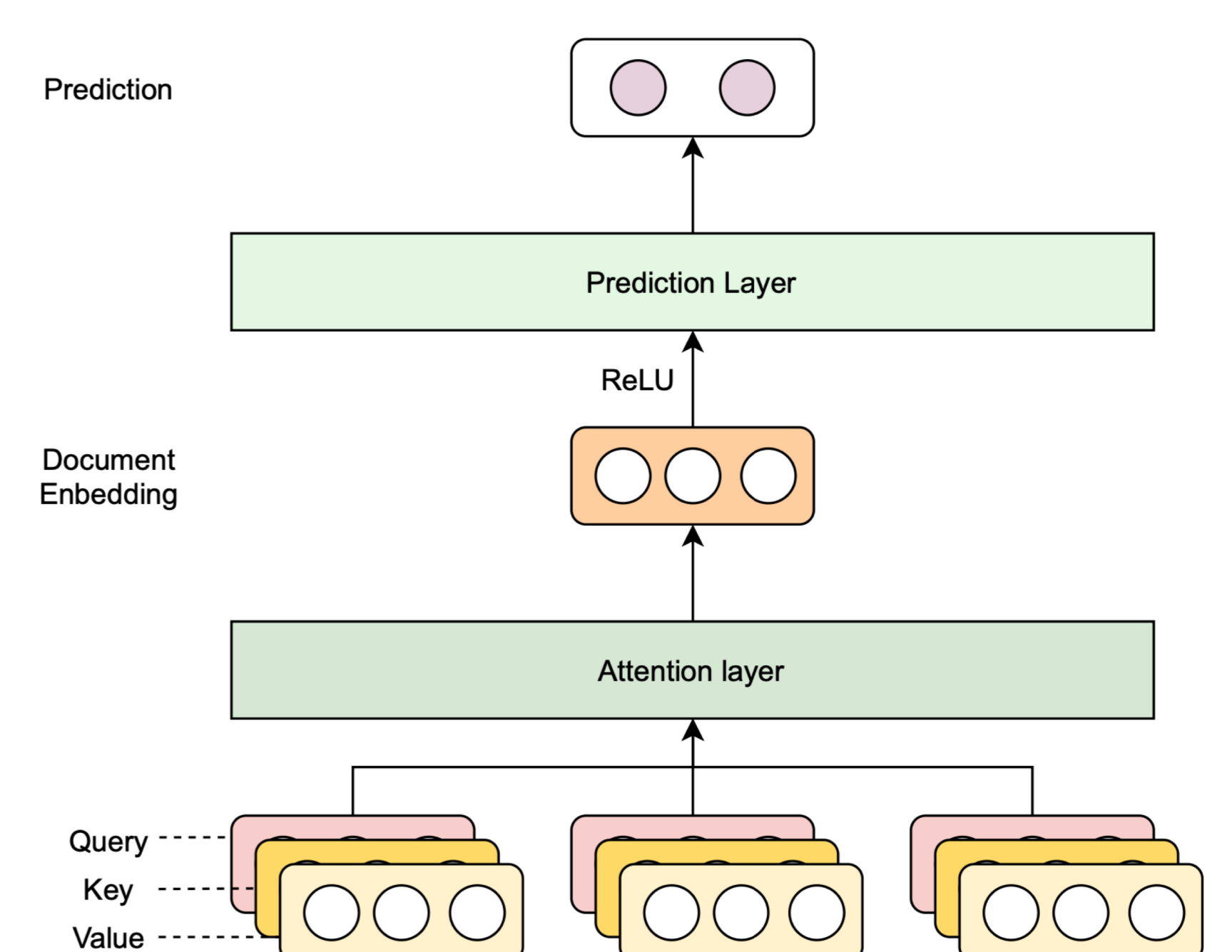
Attention Weight Visualization
If a news is predicted as positive (i.e., potentially highly correlated with the DC events), the news title is highlighted in red. After clicking the positive news title, a window showcasing the news title and content with highlighted keywords will pop up. To help visualize the importance of each word, three classes of keywords are defined.

4. Attention Model

First, we represent each word in news titles and content with the pre-trained embedding from GloVe. We later construct an attention layer to aggregate the words embeddings in each news into one document embedding for each news. In our settings, the queries(Q) are initially randomized, while the keys(K) and values(V) are the GloVe embeddings for words. Here, the main concept is that every word contributes to the document embeddings by different levels; therefore, if a word accounts for a much greater weight than other words in the document do, it might be a potential keyword. After getting the document embeddings, we first apply a ReLU activation function, and then pass the embeddings to a linear classification layer to predict the final label.

5. Conclusion

- By placing the chart and related news side by side and displaying the potential keywords, users, financial professionals, and amateur investors can all understand Forex trends quicker and easier.
- We hope that this demonstration can facilitate more research on predicting Forex markets through deep learning models in the future.
- Since the real-time feature is crucial for investors, we will thrive to make INForex become a real-time system in the future, either with real-time industrial APIs.