



Figure 4: Nearest words of the word “good” from the pre-trained word embeddings.

Table 5: The results of financial aspect prediction based on 5-cross validation in terms of accuracy. The values in [] denotes filter sizes used for CNNs. ML denotes multi-label.

No.	Approach	Accuracy
1	Ridge Regression	0.3634
2	Random Forest	0.2749
3	CNN [1, 2, 3]	0.6436
4	CNN [3, 4, 5]	0.6180
5	CNN [5, 6, 7]	0.5940
6	Bi-GRU	0.5085
7	Bi-LSTM	0.4915
8	GRU	0.5274
9	CNN [1, 2, 3] - ML	0.5581
10	Voting	0.6530

our approach and the performance compared to other participated teams will be updated on <https://github.com/parklize/FIQA>.

6 ACKNOWLEDGMENTS

This publication has emanated from research conducted with the financial support of Science Foundation Ireland (SFI) under Grant Number SFI/12/RC/2289 (Insight Centre for Data Analytics).

REFERENCES

[1] Kyunghyun Cho, Bart Van Merriënboer, Caglar Gulcehre, Dzmitry Bahdanau, Fethi Bougares, Holger Schwenk, and Yoshua Bengio. 2014. Learning phrase

representations using RNN encoder-decoder for statistical machine translation. *arXiv preprint arXiv:1406.1078* (2014).

[2] Mathieu Cliche. 2017. BB_twtr at SemEval-2017 Task 4: Twitter Sentiment Analysis with CNNs and LSTMs. *CoRR abs/1704.0* (2017). arXiv:1704.06125 <http://arxiv.org/abs/1704.06125>

[3] Keith Cortis, André Freitas, Tobias Daudert, Manuela Huerlimann, Manel Zarrouk, Siegfried Handschuh, and Brian Davis. 2017. Semeval-2017 task 5: Fine-grained sentiment analysis on financial microblogs and news. In *Proceedings of the 11th International Workshop on Semantic Evaluation (SemEval-2017)*. 519–535.

[4] Clement Farabet, Camille Couprie, Laurent Najman, and Yann LeCun. 2013. Learning Hierarchical Features for Scene Labeling. *IEEE Transactions on Pattern Analysis and Machine Intelligence* 35, 8 (2013), 1915–1929.

[5] Sepp Hochreiter and Jürgen Schmidhuber. 1997. Long Short-Term Memory. *Neural Computation* 9, 8 (nov 1997), 1735–1780. <https://doi.org/10.1162/neco.1997.9.8.1735>

[6] Nal Kalchbrenner, Edward Grefenstette, and Phil Blunsom. 2014. A convolutional neural network for modelling sentences. In *The 52nd Annual Meeting of the Association for Computational Linguistics*.

[7] Yoon Kim. 2014. Convolutional neural networks for sentence classification. In *Conference on Empirical Methods on Natural Language Processing*.

[8] Diederik Kingma and Jimmy Ba. 2014. Adam: A method for stochastic optimization. *arXiv preprint arXiv:1412.6980* (2014).

[9] Alex Krizhevsky, Ilya Sutskever, and Geoffrey E Hinton. 2012. Imagenet Classification with Deep Convolutional Neural Networks. In *Advances in Neural Information Processing Systems*. 1097–1105.

[10] Yann LeCun, Yoshua Bengio, and Geoffrey Hinton. 2015. Deep learning. *Nature* 521, 7553 (2015), 436–444.

[11] Yann LeCun, Bernhard E Boser, John S Denker, Donnie Henderson, Richard E Howard, Wayne E Hubbard, and Lawrence D Jackel. 1990. Handwritten Digit Recognition with a Back-propagation Network. In *Advances in Neural Information Processing Systems*. 396–404.

[12] Nitish Srivastava, Geoffrey E Hinton, Alex Krizhevsky, Ilya Sutskever, and Ruslan Salakhutdinov. 2014. Dropout: A Simple Way to Prevent Neural Networks from Overfitting. *Journal of Machine Learning Research* 15, 1 (2014), 1929–1958.

[13] Qi Zhang, Yeyun Gong, Jindou Wu, Haoran Huang, and Xuanjing Huang. 2016. Retweet Prediction with Attention-based Deep Neural Network. In *Proceedings of the 25th ACM International Conference on Information and Knowledge Management - CIKM '16 (CIKM '16)*. ACM, New York, NY, USA, 75–84. <https://doi.org/10.1145/2983323.2983809>

[14] Shuai Zhang, Lina Yao, and Aixin Sun. 2017. Deep Learning based Recommender System: A Survey and New Perspectives. *CoRR abs/1707.0* (2017). arXiv:1707.07435 <http://arxiv.org/abs/1707.07435>