



VoC-DL: Revisiting Voice of Customer using Deep Learning

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EXPERIENCE**



Talk

- Motivation
- Prior Work
- Data Collection
- Approach
- Comparisons
- Demo
- Q&A

Motivation



Customers' Comments



trouble installing photoshop. Already paid for it

I'm trying to get a trial for LiveCycle I am considering buying it and want to try it first.

Do you offer discounted rates for Adobe stock image subscriptions for non-profit organizations?

This form does not fit for an educational model. I am department chair and also teach graphic design. So answering questions for your data will always be slightly wrong. I usually have 20 students per class.

I just purchased the 'Photoshop' but couldn't open it. please help me out !

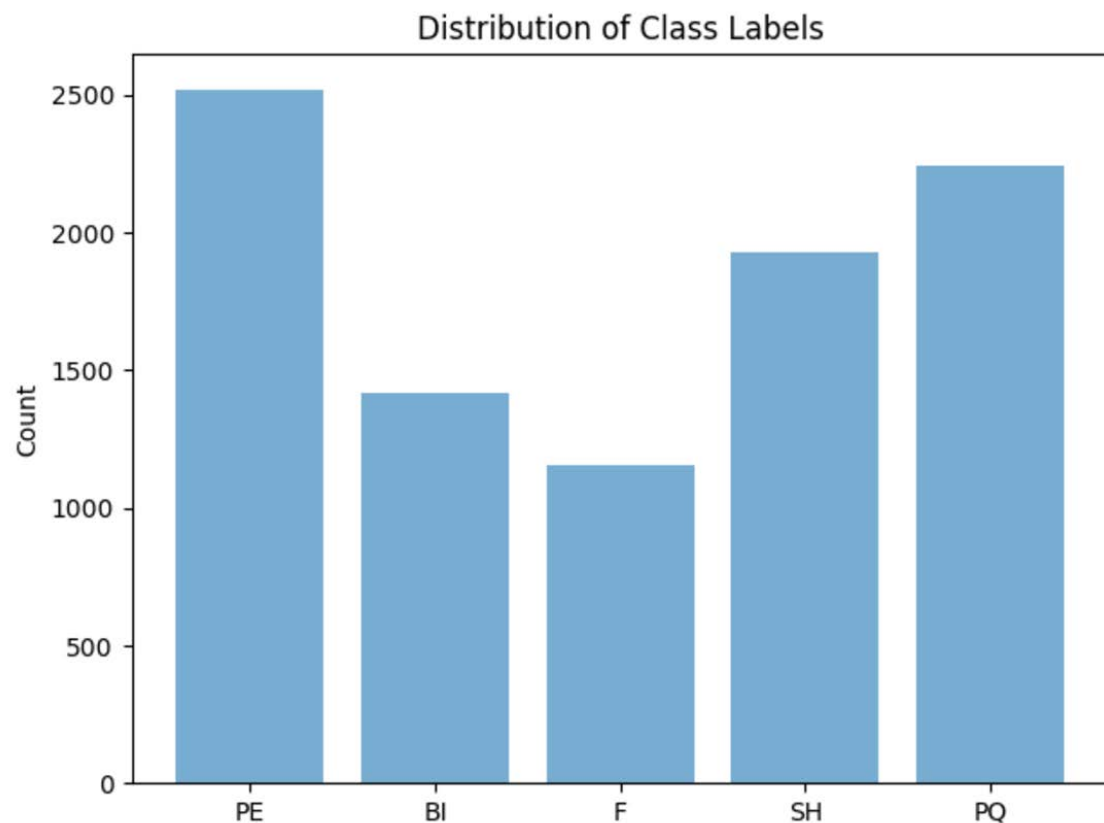
Hello,
I have spent the last hour trying to find the customer support page for Adobe Analytics. I am going in circles. Where do I go to submit issues and ask questions? I have tried all the avenues. Please tell me how to contact Customer Care.

Unfortunately, we have been unsuccessful with getting in touch with our Adobe representative for the past week and we urgently need to start the conversation for this platform. We are eager to customize a quote. Let's setup a proper demo

Prior Work

- Sentiment Analysis
 - Pang et al. 2008
- Desire Analysis
 - Goldberg et al. 2009 – Identifying ‘Wishes’
 - Ramanand et al. 2010 – Identifying ‘Buy’ signals
- Purchase Intent Analysis
 - Gupta et al. 2014 – Quora & Yahoo Answers
 - Korpusik et al. 2016 – Twitter

Dataset



Cohens kappa coefficient : 0.701

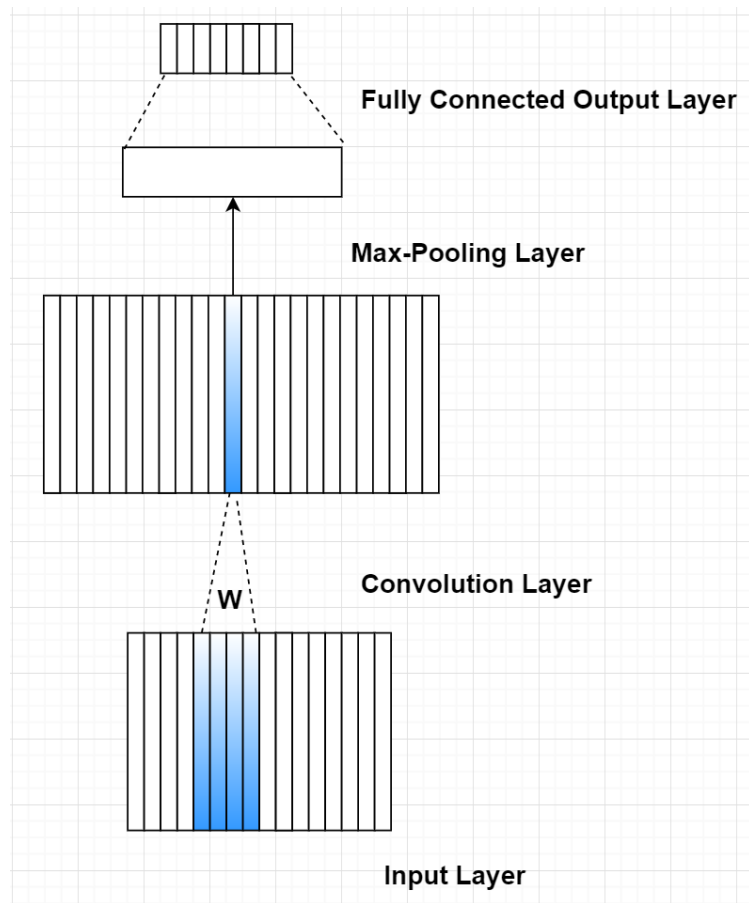
- **Product Enquiry (PE)** : Expression signifying an act of asking for product/service related information.
- **Buying Intent (BI)** : Expression signifying an intention to purchase or consume a product/service.
- **Feedback (F)** : Expression signifying some reaction to a product/service.
- **Seeking Help (SH)** : Expression signifying an act of seeking help related to a product/service.
- **Pricing Query (PQ)** : Expression signifying a question directed specifically towards pricing of a product/service.



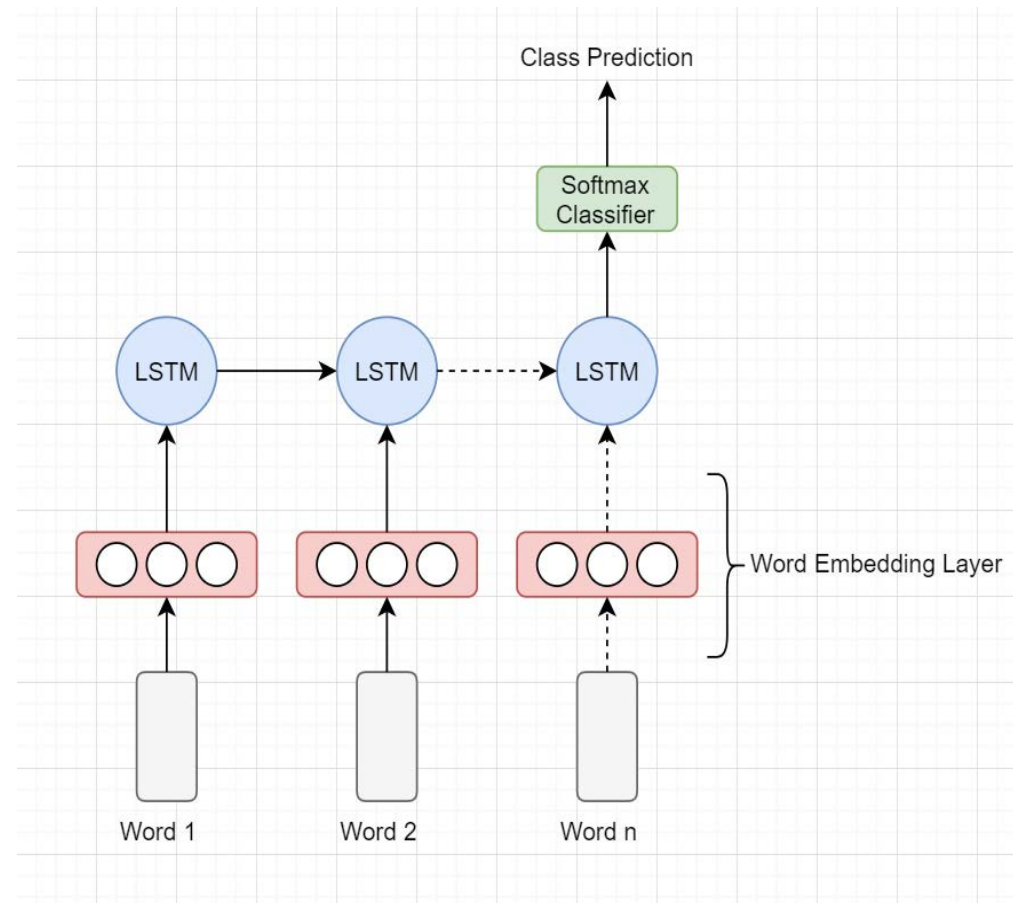
Approach

- Stage 1
 - Word Embedding
- Stage 2
 - Baseline Model – SVM
 - CNN
 - RNN
 - LSTM

Architectures



CNN Architecture



LSTM Architecture

Results & Remarks

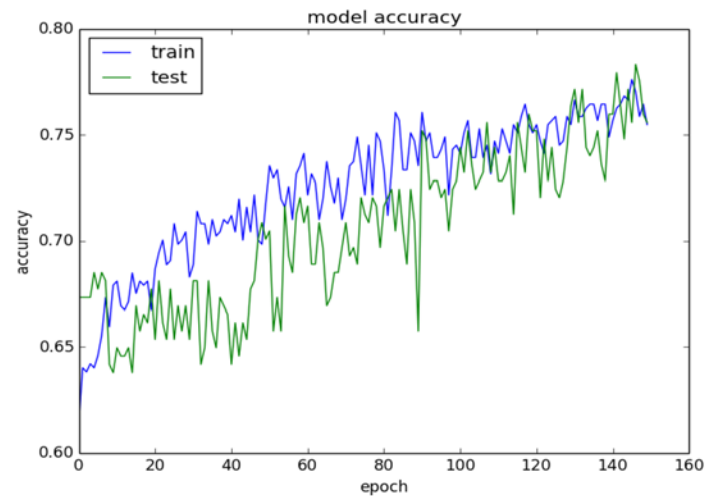
Model	Accuracy (%)
SVM	61.7
CNN	72.2
RNN	75.1
LSTM	82.3

Table 1. Experimental results (from our task)

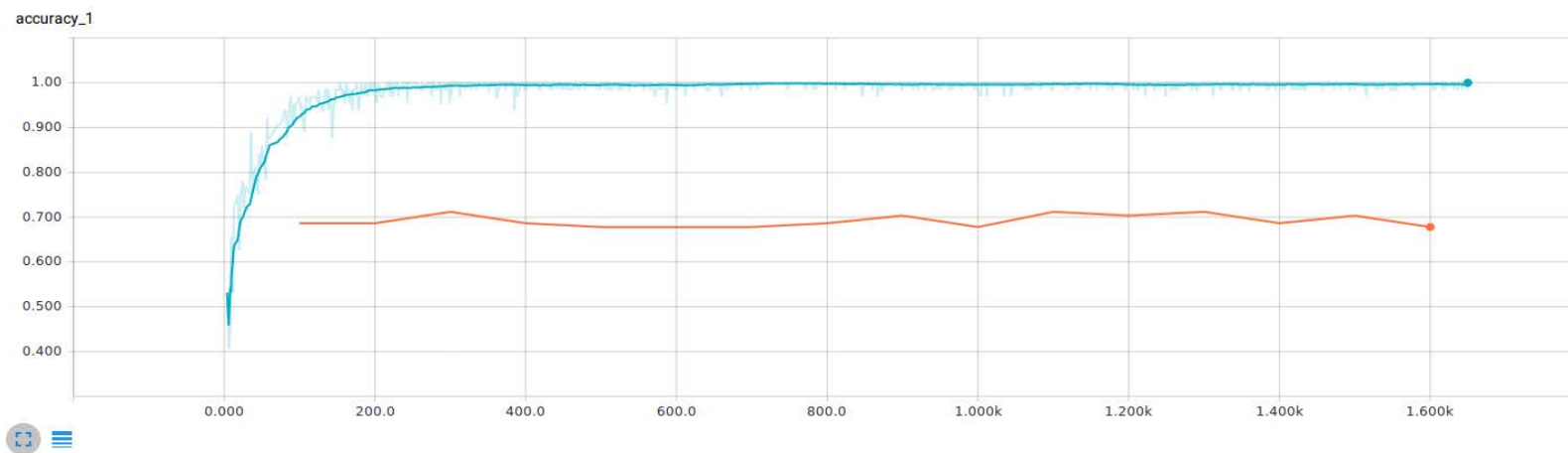
Dataset	CNN	RNN	LSTM
TREC	92.8	93.6	95.4
SST-1	43.0	42.9	46.3
SST-2	82.1	83.4	87.4
MR	75.4	77.2	82.7

Table 2. Results in % accuracy for different standard datasets and our models

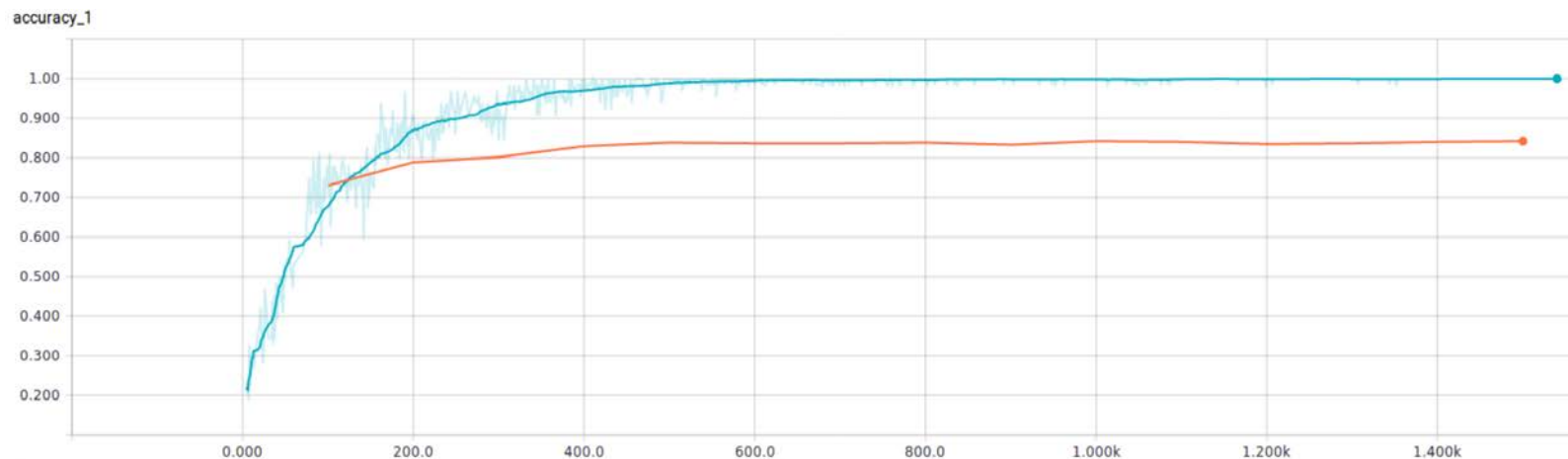
Model Accuracy



RNN



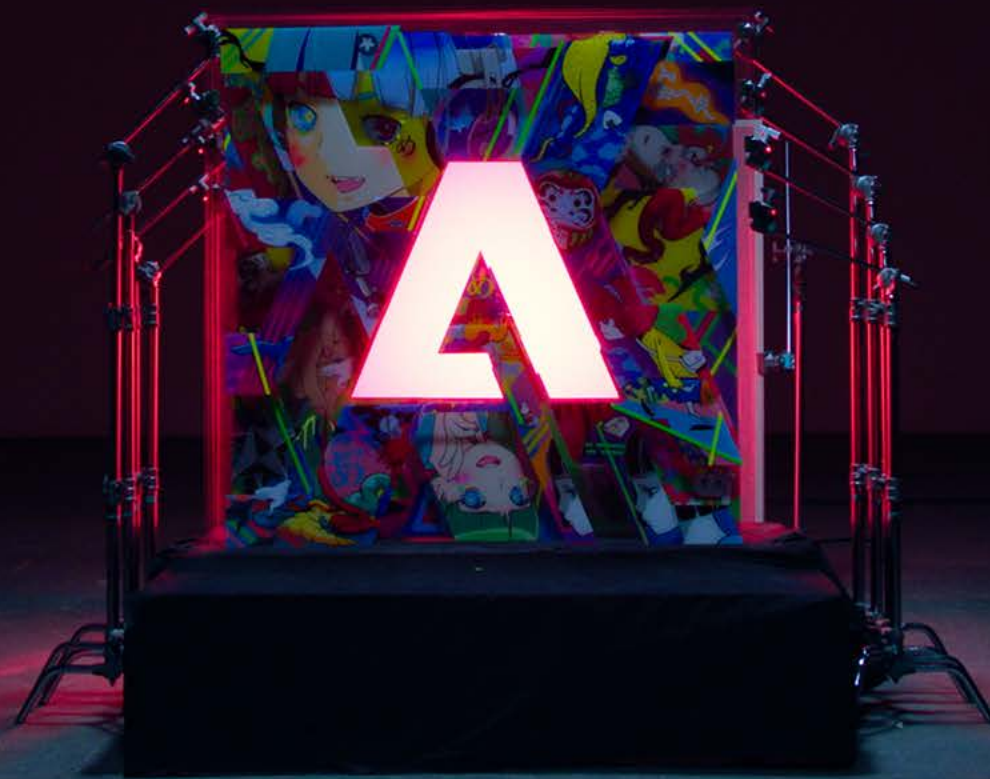
CNN



LSTM



Demo



Key References

- Gupta, V.; Varshney, D.; Jhamtani, H.; Kedia, D.; and Karwa, S. 2014. Identifying purchase intent from social posts. In ICWSM.
- Kim, Y. 2014. Convolutional neural networks for sentence classification. arXiv preprint arXiv:1408.5882.
- Ramanand, J.; Bhavsar, K.; and Pedanekar, N. 2010. Wishful thinking: finding suggestions and 'buy' wishes from product reviews. In Proceedings of the NAACL HLT 2010 Workshop on Computational Approaches to Analysis and Generation of Emotion in Text, 54–61. ACL
- Korpusik, M.; Sakaki, S.; Chen, F.; and Chen, Y.-Y. 2016. Recurrent neural networks for customer purchase prediction on twitter. In CBRecSys@ RecSys, 47–50.
- <http://pytorch.org/>
- <https://code.google.com/p/word2vec/>



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