LEARNING TO GENERATE REVIEWS AND DISCOVERING SENTIMENT [RJS17]

BORCHANI Slim, REGUIG Ghiles
Sorbonne Université

Objectifs

- Nouvelle représentation des données textuelles apprise par un réseau de neurones récurrent.
- Apprentissage de features de haut niveau, notamment d'une dimension transcrivant le sentiment.
- Evaluation de l'espace construit via une tâche de classification de sentiment.
- Géneration de reviews positives ou négatives selon les paramètres de la dimension de sentiment.

Données

- Apprentissage de représentation sur le Amazon Product Review Dataset.
- Evaluation sur le dataset de movie reviews IMDB.

Idée derrière le multiplicative LSTM

- RNN : Apprentissage d'un espace latent.
- Les états cachés gardent l'information jugée pertinente des temps précédents.
- Si la mauvaise information est retenue, les états suivants seront altérés et la correction sera difficile.
- Modification de l'état caché de sorte à obtenir une transition plus flexible, dépendant de l'entrée.
- Utilisation d'une matrice de transition diagonale dépendant de l'input.

$$W_{hh}^{(x_t)} = W_{hm}\mathrm{diag}(W_{mx}x_t)W_{mh}.$$

Multiplicative LSTM[KLMR16]

- Idée : Changer les paramètres W_{hh} en fonction de l'input x_t.
- Utilisation d'un état de transition m_t lors de la mise à jour de l'état caché :

$$m_t = (W_{mx}x_t) \odot (W_{mh}h_{t-1})$$
$$\hat{h}_t = W_{hx}x_t + W_{hm}m_t$$
$$i_t = \sigma(W_{ix}x_t + W_{im}m_t)$$
$$o_t = \sigma(W_{ox}x_t + W_{om}m_t)$$
$$f_t = \sigma(W_{fx}x_t + W_{fm}m_t).$$

4096 mLSTM

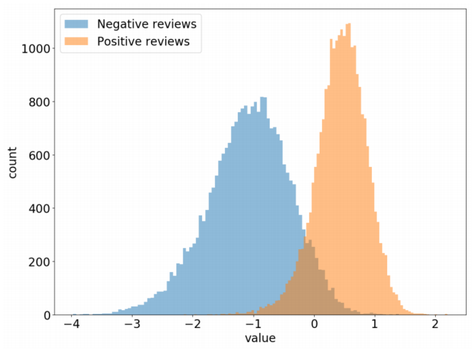


Figure 3: Histogram of cell values for the sentiment unit on IMDB reviews.

25 August 2003 League of Extraordinary Gentlemen: Sean Connery is one of the all time greats and I have been a fan of his since the 1950's. I went to this movie because Sean Connery was the main actor. I had not read reviews or had any prior knowledge of the movie. The movie surprised me quite a bit. The scenery and sights were spectacular, but the plot was unreal to the point of being ridiculous. In my mind this was not one of his better movies it could be the worst. Why he chose to be in this movie is a mystery. For me, going to this movie was a waste of my time. I will continue to go to his movies and add his movies to my video collection. But I can't see wasting money to put this movie in my collection

Judy Holliday struck gold in 1950 withe George Cukor's film version of "Born Yesterday," and from that point forward, her career consisted of trying to find material good enough to allow her to strike gold again. It never happened. In "It Should Happen to You" (I can't think of a blander title, by the way), Holliday does yet one more variation on the dumb blonde who's maybe not so dumb after all, but everything about this movie feels warmed over and half hearted. Even Jack Lemmon, in what I believe was his first film role, can't muster up enough energy to enliven this recycled comedy. The audience knows how the movie will end virtually from the beginning, so mostly it just sits around waiting for the film to catch up. Maybe if you're enamored of Holliday you'll enjoy this; otherwise I wouldn't bother. Grade: C

Team Spirit is maybe made by the best intentions, but it misses the warmth of "All Stars" (1997) by Jean van de Velde. Most scenes are identic, just not that funny and not that well done. The actors repeat the same lines as in "All Stars" but without much feeling.

Multiplicative LSTM - Comparaison aux autres modèles

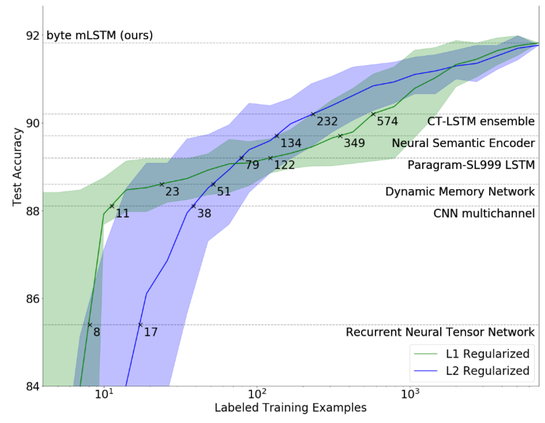
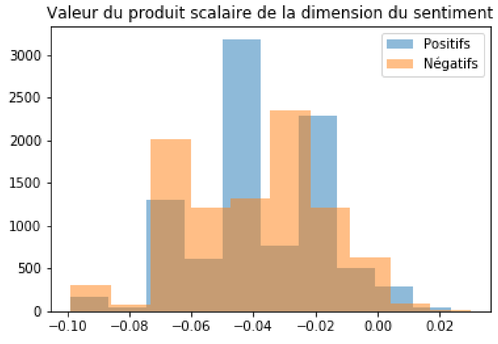


Figure 2: Performance on the binary version of SST as a function of labeled training examples.

512 mLSTM

- Implémentation d'un modèle à 512 mLSTM.
- Apprentissage sur des séquences de taille 20 tirées de reviews Amazon.
- Évaluation de la représentation par classification de sentiment sur des phrases tirées de reviews IMDB.
- Utilisation d'une simple régression logistique.



Conclusion

- Apprentissage non supervisé rivalisant avec l'état de l'art
- Représentation latente apprise stable, malgré un apprentissage non supervisé
- Géneration de texte de haute qualité pour un modèle de langue travaillant sur le byte
- Meilleure interprétabilité des représentations

Réferences

[KLMR16] Ben Krause, Liang Lu, Iain Murray, and Steve Renals.
Multiplicative lstm for sequence modelling.
arXiv preprint arXiv:1609.07959, 2016.

[RJS17] Alec Radford, Rafal Jozefowicz, and Ilya Sutskever.
Learning to generate reviews and discovering sentiment.
arXiv preprint arXiv:1704.01444, 2017.