

Experiment 3

Experimental requirements

Write the language model of RNN, and based on the trained word vectors, write the RNN model for text classification. Ask a teaching assistant to prepare relevant data sets (references are as follows)

Yang, Zichao, Diyi Yang, Chris Dyer, Xiaodong He, Alex Smola, and Eduard Hovy. "Hierarchical attention networks for document classification." In *Proceedings of the 2016 conference of the North American chapter of the association for computational linguistics: human language technologies*, pp. 1480-1489. 2016.

Experimental steps

1. Network framework: You are required to choose one of pytorch or tensorflow, and install the package according to the instructions on the official website. (If the previous The experiment has already been installed, so this can be skipped)
2. Data set: This experiment uses the Yelp2013 data set. Use test.json in the data set as the test set, and use
Manually divide the training set and validation set in yelp_academic_dataset_review.json. Download link: https://github.com/m/rekksab/Yelp/tree/master/yelp_challenge/yelp_phoenix_academic_dataset only needs to use stars rating and text review content. **3. Model building: Use the module encapsulated by pytorch** or tensorflow to write the model, such as torch.nn.Linear(),

torch.nn.ReLU(), etc., there is no need to manually complete the underlying forward and backward processes.
4. Model training: Input the generated training set into the built model for forward loss calculation and reverse gradient propagation to train

model, it is also recommended to use the optimizer encapsulated by the network framework to complete the parameter update process. During the training process, the loss of the model on the training set and validation set is recorded, and plotted for visualization.
5. Parameter adjustment analysis: Test the trained model on the verification set, and use **Top 1 Accuracy (ACC)** as the network performance indicator.

Then, adjust dropout, normalization, learning rate decay, residual connection, and network depth, then retrain and test, and analyze the impact on model performance.
6. Test performance: Choose the set of hyperparameters that you think is most appropriate (e.g., the one that performs best on the validation set), retrain the model, and test on the test set (note, this should be the only time in your experiment test on the test set) and record the results of the test

 $\bar{y}ACC\bar{y}$

Experiment submission

The deadline for this experiment is 23:59:59 on **December 17**. Code source files and experiment reports must be submitted to the email address: ustcdl2023@163.com, the specific requirements are as follows:

1. There is no sample code for this experiment. You need to complete the data processing and build the entire pipeline by yourself.
2. All files are packaged in a compressed package. The compressed package is named student number-name-exp3.zip.
3. The experimental report requires pdf format. It is required to include name and student number. The content includes a brief experimental process and key code display, as well as super parameters

Experimental analysis of numbers, training set and validation set loss curves under optimal hyperparameters, and experimental results on the test set.