First project peer review (TopoHyperDrive)

1. Problem statement, main idea, comparison with relevant methods

The problem posed in the text of the article is clear. The main idea is also clear (as I understand it, it is to study the internal structure of embeddings).

Also in this article I really liked the chapter “Related Works”. It clearly traces the evolution of methods over time and why this evolution occurred. This chapter also clearly describes the advantages and disadvantages of the described methods. What about comparing the new approach with existing ones, I clearly saw a comparison of CCA and CKA with RTD, which is the basis of the method proposed by the author. Moreover, the text says that another method for solving the hyperparameters optimization problem is black-box optimization. Although the text of the article lists its limitations, there is no obvious comparison with the new proposed method (TopoHyperDrive). So it is not clear why the proposed method is better than black-box optimization.

2. Describe if each part is described clearly and all the necessary for understanding information is provided. What is missing? What is left uncovered? Can it be done better?

I really liked the “Abstract” and “Introduction” parts, everything was clear for me. In “Related Works”, I really liked the description of the evolution of the development of knowledge in the field of optimization of hyperparameters, but there was not enough comparison of black-box optimization with the method proposed by the authors.

In the “Methods” chapter, subparagraphs 3.1 and 3.2 were also clear to me. But I would give advice to the author: when describing the RTD, I would add pictures from the original article, they explain what is happening very well and make it easier to understand (but even without them everything is already clear). Also in this chapter, I didn’t understand a little (or maybe I overlooked) how RTD is involved in optimization. I got that RTD will allow you to compare output embeddings, but I didn’t understand what happens after the comparison.

The chapter “Experiments” is very well written, everything is very clear.

For some reason, the “Results” chapter of the article appears as a sub-section of the “Experiments” chapter; it’s probably worth highlighting separately. Also in the results chapter there is not enough description of picture 1 (I understand that most likely the author has not yet had time to formalize the results, because these are only intermediate results).

3. Recommendations on styling, quality and structure.

Styling and quality: the article was written very cool, after reading it I got the feeling that the author knows a lot on this topic.

Structure: the structure is good, but the results chapter needs to be separated from the experiments

4. Experiments and results.

The experiment protocol and presented results are reasonable.

5. Github repository.

Github and README are well designed. The structure of the project is clearly visible in Github. Following README, I was able to install all the dependencies, train the model and reproduce hyperparameter search experiments (tpe_search_optuna).

6. Code reproducibility

I ran the scripts that were provided by the author. Provided code is running without errors. I was also able to run hyperparameter optimization. The validation scores and losses obtained during optimization are identical to the values provided by the author (checkpoint from the logs)

7. Other improvements

I am sure that the author already knows what needs to be completed, but I would advise continuing to optimize the hyperparameters using other methods (Random search, Hyperband, BOHB and TopoHyperDrive).