Figures and Tables for results

1. Trend plots of all hyperparameters

8 hyperparameters (epochs/batch\_size/L1/L2/dropout\_rate/learning\_rate/momentum/decay)

3 datasets (10year/15year/12year?)

Total 24 figures

Each hyperparameter has 10 trend plots, each represents a background setting

Analysis:

Uptrend(best point)/Downtrend(best point)/Steady State(the variance of values)

inflection point

1. Time compare and analysis

* a table with all hyperparameters and their total running time based on three datasets

[Hyperparameter; number of models each background setting; total number of models trained, total running time].

* trend plots related to the relationship between time and the value of hyperparameter, To find out whether there is a linear relationship between the value of the hyperparameter and the training time

8 hyperparameter \* 3 datasets (24 figures each with 10 background setting)

Detailed plan for writing the manuscript.

* + - Abstract Om, Yijun, and Xia Jiang (Check with Om to see if he is Ok to put together the first draft of the abstract?)

Abstract can be a summary of all parts below, so it could be done after all below are finished. **Deadline 7/28/2023.**

* + - **Introduction**(background) **Yijun & Dr. Jiang.**

**Deadline 7/21/2023.**

* + - * Review a bit about prediction of breast cancer metastasis. (Xia Jiang)
      * Review a bit about using deep learning to do the prediction. (Xia Jiang)
      * Review a bit about grid search and hyperparameter tunning. (Xia Jiang)
      * Talk about the rational to create the SHGS methods (Xia Jiang)
      * Yijun and Om will proofread and give feedback.
    - **Method.** **Yijun, Dr. Jiang, and Om**

**Deadline 7/14/2023**

2.1. Description of Single Hyperparameter Grid Search(SHGS)

* + Dr. Jiang has wrote about the SHGS method in the initial draft, and will further refine it. (Xia Jiang)
  + Om can contribute to the method by including and explaining his follow chart. (Om)

2.3. Detailed descriptions of the experiments

* + The implementation of the SHGS method (Yijun).
  + Hyperparameters and values we used, considering including a table here (Yijun)
* 2.3. Dataset

**Deadline 7/7/2023**

Introduce the dataset (Xia Jiang).

make sure the paragraphs from each of the coauthors being connected smoothly (Xia Jiang).

Each coauthor should proofread other coauthor’s writings.

* + - **Results**. **Yijun, and Dr. Jiang**

**Deadline 7/7/2023**

Need to describe the tables/figures generated (tell what they), and will give the rational for including it and the basic (direct) observations based it.

3.1. trend plot of values of target\_hyperparameter to test\_auc (Yijun)

3.2. trend plot of values of target\_hyperparameter to running\_time (Yijun)

* Yijun needs to clean the results of 10, 12, and 15year to make each target\_hyperparameter only has 10 experiments.
* Yijun needs to generate the trend plots of values of target\_hyperparameter to test\_auc/running\_time of 10, 12, and 15year dataset (for 15years dataset, need to retrieve points based on steps)
  + - * Yijun could take responsibility of epochs/batch\_size/l1/l2/dropout\_rate
      * conduct retouching/refining (Xia Jiang)
    - **Further result Analyses/Discussion**. **Yijun, Om, and Dr. Jiang**

**Deadline 7/21/2023**

Results analyses are about further analyses and discussions about the results and observation made based on the results. Now it is time to connect your findings with finding from other peoples’ research (**literature searching involved**). Discuss why other people have different/same findings from/as yours. If your finding are not consistent with other peoples’s findings, then your could offer an justifications. There are 8 target\_hyperparameters in total (epochs/batch\_size/L1/L2/dropout\_rate/learning\_rate/momentum/decay)

Yijun discuss the follow five, deadline 7/21/2023:

Epochs

Batch\_size (Yijun, deadling 7/21/2023

L1 (Yijun)

L2 (Yijun)

Dropout (Yijun)

Om discuss the following three, deadline 7/21/2023

learning\_rate (Om)

momentum (Om)

decay (Om)

retouching/refining (Xia Jiang)

* + - **Conclusion. Xijun (draft), Xia Jiang (Final touch/refining)**

**Deadline 7/28/2023**

* + - **References.**

**Deadline 7/28/2023**

Each author should insert the references he/she used on during writing in a timely manner. Please use the same reference list that Jiang created. Save references in the shared library, and save and push the manuscript each time you finish your editing work. Every time before you start working on the manuscript, please make sure you pull first to get the newest version.

Yijun should organize and clean references in case that someone did not do it correctly.

Timeline.

|  |  |  |
| --- | --- | --- |
| week | Experiment Running | Paper writing tasks**(Everything must be done by Friday of the week)**  Ps. All analysis work should include both test\_auc and running time  P(Ps). All tables/related figures will be stored in a directory /Users/xij6/Documents/Research/git/ProjectW81X-Github/keras/manuscript\_preparation/SHGS/supporting\_docs/Figures |
| 1(0619-0625) | 1.Yijun run 12years&20years dataset to do the estimation of time;  2.Dr. Jiang and Yijun choose one of these two datasets to use in the paper and Yijun make the running plan | |  | | --- | | **Yijun:**  1. needs to clean the results of 15year & 10year to make each target\_hyperparameter only has 10 experiments  2. needs to generate the trend plots of values of target\_hyperparameter to test\_auc/running\_time of 15year&10year dataset (for 15years dataset, need to retrieve points based on steps) | | **Om:**  1.could learn the basic concepts of neural network models and have a basic understanding of the meaning of each hyperparameter | |  | |
| 2(0625-0701) | Yijun run the third dataset | |  | | --- | | **Yijun:**  1. needs to do the analysis based on 15year/10year experiment results for ‘epochs’ and ‘batch\_size’  2. Yijun needs to finish the Introduction/ background part  3. Yijun needs to describe SHGS in more details based on Dr. Jiang’s description of the basic idea and make the draft | | **Om:**  1.needs to do the analysis based on 15year/10year experiment results for ‘learning\_rate’ | |  | |
| 3(0701-0707) | Yijun run the third dataset | |  | | --- | | **Yijun**:  1. needs to do the analysis based on 15year/10year experiment results for ‘L1’,’L2’,’dropout\_rate’  2. needs to clean the results of 20years/12years to make each target\_hyperparameter only has 10 experiments  3. needs to generate the trend plots of values of target\_hyperparameter to test\_auc/running\_time of 20year/12year\_dataset | | **Om:**  1.needs to do the analysis based on 15year/10year experiment results for ‘momentum’ and ‘decay’ | | **Dr. Jiang:**  needs to give the feedback of Introduction part and 2.2SHGS part to Yijun, then Yijun could revise them | |
| 4(0708-0714) |  | |  | | --- | | **Yijun:**  1.needs to complete the analysis of the five hyperparameters(‘epochs/batch\_size/L1/L2/dropout\_rate’)  2. needs to make the table of all running time on three datasets and do the general analysis  3. needs to revise Introduction and 2.2SHGS part based on Dr. Jiang’s feedback | | **Om:**  needs to complete the analysis of the three hyperparameters(‘learning\_rate’,’momentum’,’decay’) on all three datasets | | **Dr.Jiang:**  needs to introduces the dataset, which will be placed in 2.1 of the paper | |
| 5(0715-0721) |  | |  | | --- | | **Yijun:**  1. needs to organize and integrate all parts so far  2. needs to finish the Conclusion part | |  | | **Dr.Jiang:**  needs to give the feedback of analysis part | |
| 6(0722-0728) |  | |  | | --- | | Yijun needs to revise the paper based on Dr. Jiang’s feedback | | **Om:**  1.needs to revise the paper based on Dr. Jiang’s feedback  2.also needs to make the poster for the symposium | | Dr. Jiang could help Yijun and Om to revise the paper | |
| 7(0728-0804) |  | Polish and finalize the paper |
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| --- | --- |
| week | Tasks related to iMed |
| 1(0619-0625) | |  | | --- | | **Yijun:**  1.On AWS, create a new environment to deploy iMed | | **Om:**  1.register and log in on imed  2.try to share a dataset  3.try to share a model  (record all the problems you met and any change suggestions during the test) | |  | |
| 2(0625-0701) | |  | | --- | | **Yijun:** | | **Om:** | |  | |
| 3(0701-0707) | |  | | --- | | **Yijun**: | | **Om:** | | **Dr. Jiang:** | |
| 4(0708-0714) | |  | | --- | | **Yijun:** | | **Om:** | | **Dr.Jiang:** | |
| 5(0715-0721) | |  | | --- | | **Yijun:** | |  | | **Dr.Jiang:** | |
| 6(0722-0728) | |  | | --- | | **Yijun:** | | **Om:** | |  | |
| 7(0728-0804) |  |
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