1. What figures and tables should be in our paper
   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 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)

* 1. Use box plot to compare the results of mean\_test\_auc and test\_auc

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

Analysis:

 if the general values of test\_auc is much lower than mean\_test\_auc;

=> overfitting

If both the values of train\_auc and test\_auc are small => underfitting….

1. Timeline
   1. number of weeks:  8
   2. week1 (0611-0617)
   3. week2 (0618-0624)
   4. week3 (0625-0701)
   5. week4( 0702-0708)
   6. week5 (0709-0715)
   7. week6 (0716-0722)
   8. week7 (0723-0729) - a symposium(座谈会）on July 26
   9. week8 (0729-0804）- a final presentation
2. the process plan

|  |  |  |  |
| --- | --- | --- | --- |
| week | Experiments running | Result analysis and plot | Read related papers and write(focus on different hyperparameters and do the analysis, then integrate to the paper, the total number of hyperparameters is 8) |
| 1 | Run 15-year momentum; done  Begin to run 5-year experiments | Rewrite the functions of time/trend plot, make the procedure to generate the figures we need | Read papers related to grid-search/random-search |
| 2 | Run 5-year experiments | 1. create a directory to store all figures/tables related to the paper 2. clean all experiment results of 10year/15year to make each target hyperparameter only has 10 groups of experiments 3. Generate target\_hyperparameter to test\_auc/running\_time for both 10years and 15years 4. Generate target\_hyperparameter to mean\_test\_auc/test\_auc box\_plot | From week2-week5, each week focus on 2 target hyperparameter, and do some general analysis based on 15year/10year results, Write information about hyperparameters that are planned to be placed in the method section  Focus on three parts:   1. Definition 2. how its increase affects AUC changes, training time increase, overfitting, underfitting, gradient descent, and gradient exponent? 3. Which hyperparameters have interdependent reactions   Week2:  Epochs; batch\_size  Week3:(related to optimizer)  Learning\_rate  decay  Momentum  Week4:  Dropout\_rate  Week5:  L1,L2 |
| 3 | Run 5-year experiments |  | Week3:(related to optimizer)  Learning\_rate  Decay  momentum |
| 4 | Run 5-year experiments |  | Week4:  Dropout\_rate |
| 5 (0709-0715) | Run 5-year experiments | 1. clean all experiment results of 5year results to make each target hyperparameter only has 10 groups of experiments 2. Generate target\_hyperparameter to mean\_test\_auc/test\_auc/running\_time for 5year reuslts 3. Generate target\_hyperparameter to mean\_test\_auc/test\_auc box\_plot | Week5:  L1,L2 |
| 6 |  | 1. Put all figures and tables into the manuscript | 1. Finish part a(trend plots) and part b(time analysis) |
| 7 |  |  | 1. Finish part c(box-plot) 2. put all the information we want to show into the paper |
| 8 |  |  | Polish and make final changes; |

|  |  |
| --- | --- |
| week | Specific tasks for Om |
| 1 | 1. Review SHGS and grid search 2. Update the readme file of SHGS to make it more clear 3. Learn how to generate the trend plots |
| 2 | Plan for week2-week6:  help to generate figures  Learn individual hyperparameters and help analyze results  Help to test some functions in imed |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 | Polish and make final changes;  Prepare for the symposium; |
| 8 | Prepare for the final presentation |