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Deep Learning Lab Course
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Deep Learning Lab Report

In the 4th assignment of the deep learning lab course, some hyperparameter optimization techniques, namely Bayesian Optimization, Hyperband and BOHB, were introduced. In the bayesian optimization part, I implemented the BO loop where new sample x is chosen by optimizing the acquisition function, and its performance y is evaluated, and the dataset is augmented with the (x, y) pair to refit the GP model in iterative manner. The implementation was fairly straightforward, and took around 1 hour.

In the Hyperband part, I implemented an iteration of succesive halving, where configurations race against each other and only 1/eta proportion of configurations survive to the next round with higher budget. Also, by following the link to the tutorial provided the exercise, I could easily compute the number of initial configurations and budgets. The implementation took around 1.5 hour.

In the BOHB part, I implemented sampling new configuration by optimizing the expected improvement, and refitting KDEs based on new good/bad splits at each epoch. The plotted graph shows that the errors of configurations decreases with successive halving. However, I also observe that sometimes the error of some configuration with maximum budget reaches higher than all of those with lower budgets. This could be the result of overfitting, or noise introduced by using the surrogate model. Overall, the graphs reflect the properties of Hyperband and BOHB. This part of the assignment took around 6 hours.