Hi Nick,

Hope you're learning a lot of new things here. One, important thing I wanted to highlight is using Bayesian Optimization for hyperparameters tuning. As Data Scientists, we come across many models where the performance of the model is not quite as what we expected, in such scenarios we can tune the parameters of the model to see the performance. In case of deep learning networks or models that run on large datasets, it is not possible to change parameters and check model performance again and again. Therefore, it is better to spend time on finding the 'good' hyperparameter space, where we should concentrate our search. This is what Bayesian Optimization is.

Bayesian optimization, keeps track of previous evaluation results by which it forms a probabilistic model, in which hyperparameters are mapped to a probability score on the objective function. This model is called "surrogate" for the objective function, because as the name suggests- it acts similar to the original objective function, but it's not the same. The next sampling points are selected by an "Acquisition function" or also called the "Selection function". The hyperparameters found, are then used on the original objective function. The results from this actual objective function are used to update the surrogate model. This is done repeatedly until max number of iterations set are reached.

As you can see, we spend more time in selecting the next right hyperparameters, thus reducing our calls to the original objective function. This makes it better than grid search and random search, where we are evaluating our objective function without searching in the "optimal search space" and without any informed decisions based on past evaluations.

The time spent in selecting the next hyperparameters, which reduces the calls to the objective function, serves us better in computation cost as well as in time than evaluating objective functions randomly or over the entire hyperparameter space.

I hope this mail was informative and a quick starter on what Bayesian optimization is, feel free to drop by and ask any questions if you like.

Best,

Najeeb