Multiobjective Optimization in DeepHyper

Open Research Question

Ensembles of networks can outperform individual networks for many tasks and offer benefits such as uncertainty quantification

By using *multiobjective hyperparameter optimization* can we generate a more **diverse** ensemble of networks?

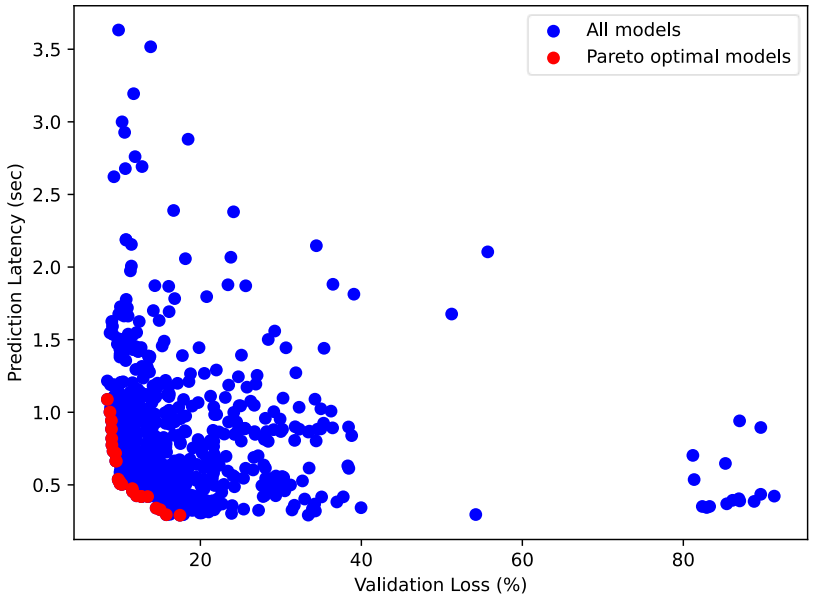
Will this diversity of the ensemble improve the **robustness** of the predictions?

DeepHyper Multiobjective Optimization

DeepHyper currently supports several common scalarization techniques for multiobjective optimization

- Linear (weighted-sum) scalarization
- Quadratic scalarization
- (Augmented) Chebyshev scalarization method
- Progressive-boundary intersection (PBI)

Can we generate a **robust** ensemble by running *different* scalarizations on each node?



Preliminary results from using DeepHyper with randomized scalarizations to perform joint architecture-hyperparameter search on the JAHS_201_Benchmark problem for the CIFAR-10 dataset