

Hyperparameter optimization significantly impacts model performance and substantial effort went into the development of robust and efficient algorithms for this task. Our research found that several new algorithms utilizing partial evaluations have been published recently. However, it is not clear from the literature how the algorithms perform in various scenarios. In this thesis, we compared the leading algorithms through experiments on diverse tasks, including tabular benchmarks and real-world deep-learning problems, with a special focus on healthcare datasets. The results show that the recent multi-fidelity techniques outperform random search. Nevertheless, no single algorithm consistently excelled across all problems, highlighting the need for ongoing comparison studies in hyperparameter optimization.