base learner

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Abstract

Definition

A base learner is an machine learning (ML) method used within an ensemble. Formally, it is an algorithm $\mathcal{A}$ that reads a training set $\mathcal{D}^{(\text{train})}$ and produces a learned hypothesis $\widehat{h} = \mathcal{A}(\mathcal{D}^{(\text{train})})$. An ensemble method runs several base learners and combines their learned hypotheses into a more suitable hypothesis.

The main approaches differ in how they construct the training sets and combine the results. Bagging trains base learners in parallel on samples generated by the bootstrap. Boosting trains them sequentially, using earlier results to modify the training set for the next base learner. Stacking uses their predictions as a feature transformation and learns an aggregation rule from the transformed features (Hastie et al., 2009, Ch. 8).

Cross References

ensemble, bagging, stacking, boosting

References

1. Hastie et al. (2009). The Elements of Statistical Learning: Data Mining, Inference, and Prediction. 2nd ed., Springer Science+Business Media, New York, NY, USA.