Boosting

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→ Ensemble method in ML that aims to create a strong classifier or regressor by combining the predictions of several weaker models.

→ High Bias Low Variance Models → Low Bias low variance

→ The idea is to build the strong model incrementally, by sequentially adding weak models that are trained to correct the mistakes made by the existing ensemble.

→ Start with a weak learner, gradually turn it into a strong learner by letting future weak learners focus on correcting mistakes made by previous learners.

→ Sequential / Stage-wise learning

A weak hypothesis or weak learner is defined as one whose performance is at least slightly better than random chance.

These ideas built upon Leslie Valiant's work on distribution free or Probably Approximately Correct (PAC) learning, a framework for investigating the complexity of machine learning problems.

Hypothesis boosting was the idea of filtering observations, leaving those observations that the weak learner can handle and focusing on developing new weak learns to handle the remaining difficult observations.

> *The idea is to use the weak learning method several times to get a succession of hypotheses, each one refocused on the examples that the previous ones found difficult and misclassified. ... Note, however, it is not obvious at all how this can be done*