AI Overview

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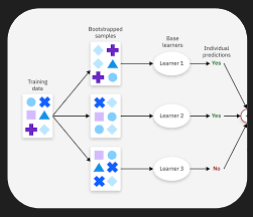
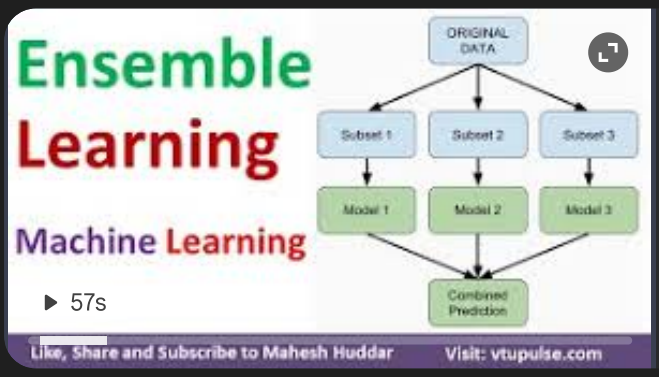


Ensemble techniques combine multiple individual models (base learners) to create a single, more accurate predictive model. This "wisdom of the crowds" approach works by aggregating the outputs of the individual models through methods like voting, averaging, or stacking, resulting in improved generalization and reduced overfitting compared to using a single model alone. Common examples include Random Forest (which uses bagging) and Gradient Boosting.

This video explains the concepts of ensemble learning with a focus on voting, bagging, and boosting:



Ensemble Learning Techniques Voting Bagging Boosting ...

Mahesh Huddar
YouTube • 16 May 2023

Key concepts

- **Combining models**: The core idea is that a group of models can make a better collective decision than any single model.
- **Base learners**: These are the individual models that are combined. They are often trained on different subsets of the data.
- **Aggregation**: The final prediction is determined by combining the outputs of the individual models. Common aggregation methods include:
  - **Voting**: Each model "votes" for a prediction, and the majority vote wins.
  - **Averaging**: The predictions are averaged to produce a final result, which can be weighted to give more importance to better-performing models.
  - **Stacking**: A meta-model is used to learn how to best combine the predictions of the base models.

Popular types

- **Bagging**: This method involves training multiple models on different bootstrap samples (random samples with replacement) of the original dataset. Random Forest is a popular bagging algorithm that uses decision trees as its base learners.
- **Boosting**: This is a sequential technique where models are built one after another, with each new model focusing on correcting the mistakes made by the previous ones. Examples include AdaBoost and Gradient Boosting.

You can watch this video to learn about bagging and boosting in detail:

Ensemble Learning Tutorial | Ensemble Techniques | Machine ...

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Benefits

- **Increased accuracy**: Ensemble methods consistently yield higher accuracy than individual models.
- **Improved generalization**: They are more likely to perform well on unseen data because they are less sensitive to noise and outliers.
- **Reduced overfitting**: Combining multiple models helps to reduce variance and bias, leading to a more robust model.

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Ensemble Methods - Overview, Categories, Main Types

Ensemble methods are techniques that combine multiple models to improve the accuracy of results in models. They are ideal for regr...

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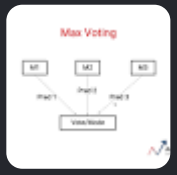

11 Mar 2021 — Introduction. Ensembling is nothing but the technique to combine several individual predictive models to come up with t...

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