Stacking Algorithm for Ensemble Modelling

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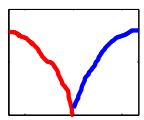
Motivation - The wisdom of the crowd

- The aggregation of individual guesses in groups is often superior to individual guesses - even to experts
- BUT: Only fulfilled under certain criteria
  - Variation of guesses
  - Independence of guesses
  - Decentralization
  - Algorithm



Outline

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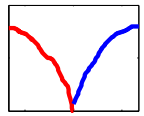
2. Ensemble Learning
3. Decision Tree
4. Bagging and Random Forest
5. Boosting and Gradient Boosting
6. Bayes??
7. Stacked Generalization
8. Potentials and Problems of Ensemble Learning
9. Sources



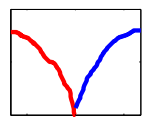
Ensemble Learning - Terminology

Machine Learning

- Part of computer science that uses statistical techniques to train models on data
- Typically used for prediction purposes

Ensemble Learning

- Idea is to combine hypotheses of multiple learning algorithms (base learners)
- Goal is to obtain a better predictive performance than with each of the single algorithms alone
- Mainly used in supervised learning
- Very flexible method

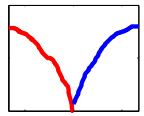


Ensemble Learning

Which models to combine?

- Effective ensembling builds on diverse and low correlated models
- Best to use strong base learners

Similar criteria as mentioned in the Motivation!



Decision Tree

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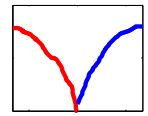

Bagging

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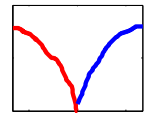

Random Forest

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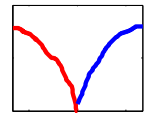

Boosting

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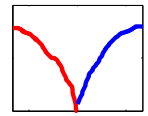

Gradient Boosting

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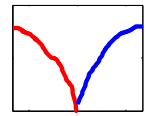

Bayes??

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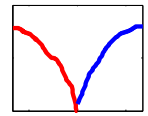

Stacked Generalization

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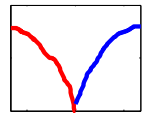

Potentials and Problems of Ensemble Learning

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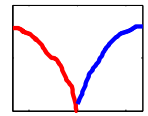

Sources


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