FEATURE SELECTION METHODS

WRAPPER METHODS | OVERVIEW

WRAPPER METHODS

- Evaluate the features in the light of a specific machine learning algorithm

- Evaluate subsets of variables

  ➢ Detect interactions between variables

  ➢ Find the optimal feature subset for the desired classifier

WRAPPER METHODS | PROCEDURE

- Search for a subset of features

- Build a machine learning model on the selected feature subset

- Evaluate model performance

- Repeat

  ➢ How to search for the subset of features?

  ➢ How to stop the search?

WRAPPER METHODS | SEARCH

- Forward feature selection

  ➔ Adds 1 feature at a time

- Backward feature elimination

  ➔ Removes 1 feature at a time

- Exhaustive feature search

  ➔ Searches across all possible feature combinations

WRAPPER METHODS | SEARCH

- Greedy algorithms

- Aim to find the best possible combinations

- Computationally expensive

- Often impracticable (Exhaustive search)

WRAPPER METHODS | STOPPING CRITERIA

- Performance increase

- Performance decrease

- Predefined number of features is reached

  ➢ Stopping criteria are somewhat arbitrary

  ➢ To be defined by user

WRAPPER METHODS | SUMMARY

- Better predictive accuracy than filter methods

- Best performing feature subset for the predefined classifier

- Computationally expensive

- Stopping criteria is relatively arbitrary