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How can I determine feature importance of an SVM classifier?

Asked by MathWorks Support Team STAFF on 14 Jun 2018

Latest activity Answered by MathWorks Support Team STAFF on 20 Jun 2018

Accepted Answer by MathWorks Support Team STAFF

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I would like to calculate feature importance for a SVM classifier, e.g. by using the metric "mean decrease accuracy".
This means I need to know how the accuracy of my classifier (calculated by cross validation) changes if I leave out features one by one.
I found functions for classification trees, but nor for SVM. How could I calculate this for SVMs?

1 Answer

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Link

Answer by MathWorks Support Team STAFF on 19 Feb 2019

Accepted Answer

In general, unless you are using a linear kernel SVM, it is not possible to use the parameters of an SVM model to analyze the importance of your features. You can refer to the following external discussions for more information about this reasoning:
https://stackoverflow.com/questions/41592661/determining-the-most-contributing-features-for-svm-classifier-in-sklearn
https://stackoverflow.com/questions/21260691/scikits-learn-how-to-obtain-features-weight
Nevertheless, you can still analyze the feature importance for your classification problem (not specific to SVM) by doing some dimensional reduction or feature extraction.
For instance, you can perform neighborhood component analysis using the "fscnca" function in MATLAB to identify relevant features for your classification:
https://www.mathworks.com/help/stats/fscnca.html
Another popular technique for feature selection is sequential feature selection which can help you select features for classifying high dimensional data:
https://www.mathworks.com/help/stats/examples/selecting-features-for-classifying-high-dimensional-data.html

See Also

MATLAB Answers

Feature Selection by NCA for an SVM classifier

1 Answer

Using feature extraction methods and a classification tree

1 Answer

Does "feature selection" consider the interdependence between multiple parameters, e.g. quotient, difference, etc., as meaningfu...

1 Answer

Entire Website

Bayesian Classifier (How many features is best ?)

File Exchange

PCA for dimension reduction in 1D data

File Exchange

Choose Classifier Options

Documentation

Tags

No tags entered yet.

Products

Statistics and Machine Learning Toolbox

Release

R2016b

You can also refer to the following documentation link for other dimensionality reduction and feature extraction techniques in MATLAB:
https://www.mathworks.com/help/stats/dimensionality-reduction.html

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