Dimensionality Reduction +4

Why would you choose feature selection algorithms over dimensional reduction?

This question previously had details. They are now in a comment.

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4 Answers

JQ Veenstra, Machine Learning Researcher/Contractor for some time
Answered Dec 3, 2016

It depends on the need.

Anything where feature identification might be important. For example: if we're specifically looking for individual features that are in some way causal, well, obviously we want to stick with features. Individual feature importances fall under this and can be used in cases where, for example, data collection is expensive, so we want to minimize on future collection.

A related, but subtly different notion, is that of identification in translation: when we do translation problems, we have to keep a record of how we translated the features. (Perhaps a better word would be... (more)

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Sean Owen, Data Science @ Databricks
Answered Dec 4, 2016

Yes, feature selection is usually useful in order to understand something more about the input. Fewer features probably makes a more interpretable model but it also says something about what features didn't matter much, and which did, which can guide collection of new features.

Feature selection chooses a subset of inputs from many. Dimension reduction transforms many inputs into fewer inputs. To get the reduced dimension representation, you still need all of the many inputs, whereas after selecting out features, they're no longer needed at all.

Dimension reduction is more efficient. That is,... (more)

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Shehroz Khan, ML Researcher, Postdoc @U of Toronto
Updated Dec 19, 2016

Feature selection is a type of dimensionality reduction technique. When you select a smaller set of features from a large number of features, you are trying to evaluate if a simpler hypothesis can still give equivalent or better performance.

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hand, for e.g. is heart rate essential for detecting agitation?

The other type of dimensionality reduction is the feature transformation such as PCA, random projection, kernel features etc. In these t... (more)

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Meir Maor, Chief Architect @SparkBeyond a Machine Learning startup
Answered Feb 1, 2017

Interpretability is probably the number one reason, but there can be others.

For example there can be a cost associated with producing the many features computationally or other and doing PCA or random projection etc. would still require paying the full cost.

Also there are many ways of selecting features and many ways to reduce dimentionality in other ways. So just like one dimentionality reduction may improve results more than another the same could be said also when comparing feature selction methods and comparing between selection and say PCA. sometimes they just give better results.

Inter... (more)

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