

PCA – separation and variance

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I have a multi-dimensional data set containing two different groups of data I want to separate utilizing PCA. I observed (by eye) that a certain set of variables gives me a good separation using the first three PCs.

What is the correlation, if it at all exists, between the separation in 3D to the actual separation in the higher dimensioned plane? How does the variance of the solution come into play? Can I say that the separation on the higher dimensioned plane is as good as or perhaps better/worse than the one in the 3D plane?

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