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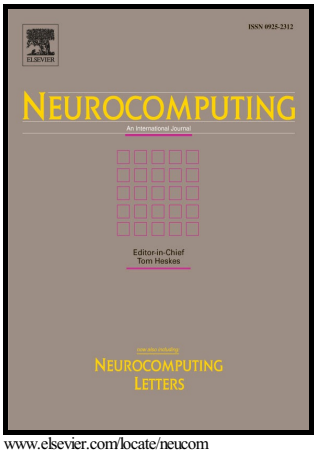

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Properties of the Box-Cox Transformation for Pattern Classification

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Abstract

The Box-Cox transformation [1, 2] has been regarded as a parametric preprocessing technique aimed at making the distribution of a set of points approximately Gaussian. Since normality represents an assumption underlying many statistical data analysis tools, such technique has been widely applied in different fields of Computer Science. In this paper we will provide evidence that this technique can be useful also in the case of Pattern Classification, where Gaussianity of datasets is not so critical. By letting the Box-Cox transform work in operational ranges which do not necessarily correspond to an increase in Gaussianity, we will show that class separability can be improved: this is likely due to the *non linear* nature of the Box-Cox transformation, which deforms the space in a nonuniform way. We will also provide some suggestions on criteria that can be used to automatically estimate the best parameter of the Box-Cox transformation in the Pattern Classification context.

Keywords: Box-Cox transformation, non linear mappings, classification, preprocessing

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