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The Journal of the Acoustical Society of America -- November 2002 -- Volume 112, Issue 5, p. 2304

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String kernels for the classification of speech data

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Support Vector Machines (SVM) have been applied to a wide variety of classification problems with excellent results. This has to do with their provable generalization ability derived from Statistical Learning Theory. Recently specialized kernels, such as the Fisher kernel and string kernels, have been introduced in an attempt to apply the same SVM framework to sequential data. Notable results have been obtained on classification tasks related to biosequences and text documents showing that the specialized kernels may provide a viable and interesting alternative to other classifiers, such as those using Hidden Markov Models. String kernels are particularly attractive because of their conceptual simplicity and they also furnish insight into the task of sequential data classification. In the present paper string kernels are applied to a new application area, that of automatic speech recognition. In particular, different string kernels are tested on the task of phoneme recognition and the results obtained are compared with those from several other common classifiers. This comparison reveals the potential of string kernels as a simple and feasible alternative to other established methods for certain speech recognition tasks. [Work supported by CONACYT under Project 31929-A.]

PACS: 43.72.Ne [Additional Information](#)

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