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ONLINE ISSN : 1348-6365

PRINT ISSN : 1882-2754

JOURNAL OF THE JAPAN STATISTICAL SOCIETY

Vol. 35 (2005) , No. 1 pp.41-59

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Estimating the Number of Components of the Fundamental Frequency Model

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Abstract: We propose a simple estimation procedure of the number of components of the fundamental frequency model when all the adjacent harmonics are present. The proposed method is based on the penalty function approach like other Information Theoretic Criteria. The new method is shown to be consistent. We compute the probability of wrong estimates of a particular penalty function and propose a re-sampling technique to estimate the probability of wrong estimates. It is observed that the probability of wrong estimates can be used to choose the *best* possible penalty function from a particular class of penalty functions. The effectiveness of the proposed method is verified using computer simulations. Two speech data are analyzed using our proposed technique and the performances are quite satisfactory. Finally, we extend our results when all the adjacent harmonics may not be present in the model.

Key words: consistent estimator, fundamental frequency, information theoretic criterion, penalty function.

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