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## **Identification of Individual Guitar Sounds** by Support Vector Machines

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## **Measurement and Results**

To estimate the influence of the various features, several feature subsets are used to for training.

Set 1: (641 features) • Fundamental frequency • Amplitudes of the first 16 partial tones Set 2: (31 features) • Fundamental frequency • First 15 nontonal peaks Set 3: (501 features) • Fundamental frequency • First 10 MFCCs Set 4: (671 features) • Fundamental frequency • First 15 nontonal peaks • Amplitudes of the first 16 partial tones Set 5: (1141 features) • Fundamental frequency • First 10 MFCCs • Amplitudes of the first 16 partial tones Set 6: (531 features) • Fundamental frequency • First 10 MFCCs • First 15 nontonal peaks Set 7: (1171 features) • Fundamental frequency • First 10 MFCCs • First 15 nontonal peaks

• Amplitudes of the first 16 partial tones

Note: The complete sound database is publicy available at : http://guitarsounds.cpt.haw-hamburg.de/

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The best performance is achived with feature set 5.

The figure below shows the dectection rates of the single guitars for feature set 5





Machine learning systems for classification.

Calculation of an optimal hyperplane for separation of the two classes. Best hyperplane is the one with the broadest margin

SVMs can only separate two classes. For multiclass-identification: One-vs-One-classification with a Directed Acyclic Graph



## **Support Vector Machines**

