CLASSIFICATION OF MUSICAL GENRE: A MACHINE LEARNING APPROACH - Summary

Introduction

- In this study: 6 classes (genres) and 300 songs

2. SYMBOLIC REPRESENTATION OF MUSICAL INFORMATION FOR GENRE DETECTION

- In this work aspects as melody, timbre and rhythm of a musical piece have been modeled by a small core of five coarse-grain feature classes: Melodic Intervals, Instruments, Instrument Classes and Drumkits, Meter/Time Changes, Note Extension.

- Construction of the dataset: asking two annotators to classify the songs, the F-measure gives the proportion of agreement on a certain class (genre)

MusicalGenres	Annotations		Common Annotations	F-Measure
	1st	2nd		
Blues	51%	40%	40%	89%
Classical	17%	17%	17%	100%
Disco	31%	24%	24%	89%
Jazz	24%	28%	23%	89%
Pop	26%	29%	20%	73%
Rock	22%	33%	22%	83%

Table 1. F-measure between annotations amongst different musical genres

- Different classifiers which are used: Naive Bayes, VFI (Voting Feature Intervals), J48, PART algorithm, NNge, RIPPER (JRip)

3. EXPERIMENTAL RESULTS

- Two categorization models have been studied:

Single Multiclass Categorization: all instances are used and assignment to one of the six musical genres decided.

Multiple Binary Categorization: different categorizers (one for each target genre) are derived by independent training processes 2 . Learning applies on positive examples as training instances of the target class C and a balanced 3 set of negative instances, randomly selected from other classes.

- Multiclass Categorization Overview:

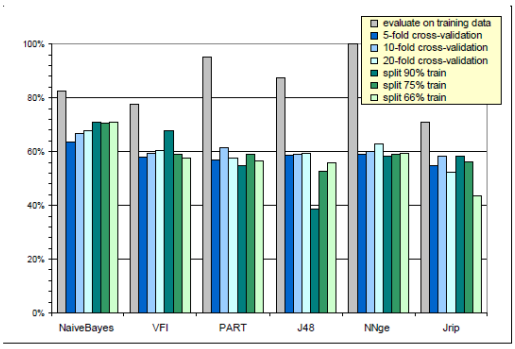

Figure 1. Multiclass Genre Classification: Performance evaluation of six different algorithms against different strategies of testing

Most effective: Bayesian classifier/ less effective is rule/tree-based classifier. Bayesian performance can be explained by the overall heterogeneity of features across the different examined classes. Rule or tree-based approaches tend to cluster the discriminatory features to produce their classifiers and impose, in this way, a generalization over the features.

Interest of the document: introductory content to AMGC, the conclusion explains well how a simple approach can be effective but has some limits (for instance with classes having some strong similarities such as Blues and Jazz)

Voc:

- surface features: melodic, rhythmic and structural aspects of songs derived from their MIDI transcriptions

- AMGC : automatic music genre classification

- MIDI file : Musical Instrument Digital Interface file.

Unlike regular audio files like MP3 or WAV files, MIDI files don't contain actual audio data and are therefore much smaller in size. For example, a MID file can explain what notes are played, when they're played, and how long or loud each note should be. Files in this format are basically instructional files that explain how the sound should be produced once attached to a playback device or loaded into a particular software program that knows how to interpret the data.