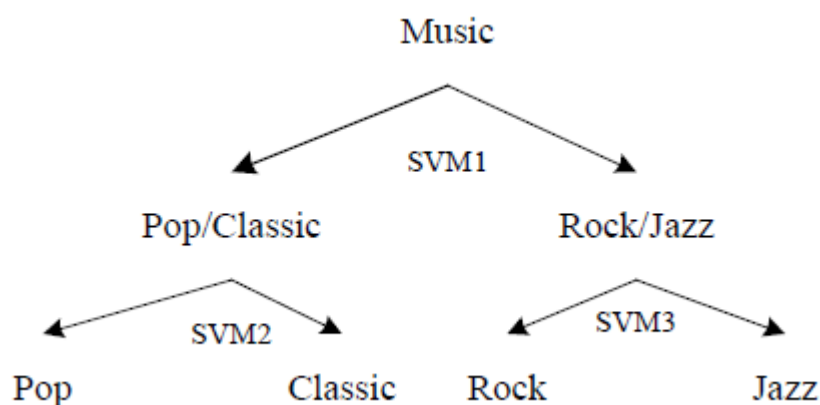


Summary Musical Genre Classification using SVMs

- 4 genres : classical, jazz, pop, rock
- Multi-layer SVM : different steps using SVMs with different features each time → first step : classifying into pop/classic and rock/jazz → second step : pop/classic is classified into either pop or classic, same for rock/jazz
- Multi-layering allows for a better respect of the hierarchical organization of genres
- **Features used** : Beat spectrum (similar to beat histogram from the other articles), Zero Crossing Rate, Spectrum Power (similar to Short Time Energy), MFCCs, LPC-derived Cepstrum (music samples are approximated as a linear combination of past music samples)
- **Algorithms used** : 2-layer SVMs (SVM 1 uses only Beat Spectrum and LPC features ; SVM 2 uses only LPC, Spectrum Power and MFCCs ; SVM 3 uses ZCR and MFCCs)



- The SVMs usually use 3 different types of kernels : polynomial, gaussian, neural networks' tanh activation function
- **Very small dataset** : 60 training samples (15 of each genre), each sample being then segmented into 2000 frames of length 882 points (at 48 kHz, these are 18ms frames, windowed with Hann window)
- Pretty good performance (approx. 7% error) BUT very small dataset, very few genres (only 4), not the most reliable results. Comparison results at the end of the article show that SVMs nonetheless perform significantly better than Nearest Neighbors, Gaussian Mixture Models or Hidden Markov Models on the same dataset.
- Main improvements according to the authors : SVMs are computationally expensive (scaling quadratically with the size of the dataset), and new **features** could be found to improve the performance