

# Machine Learning Techniques for Music Prediction



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## Hypothesis

Can a song's attributes tell us about the year in which the song was made?

Can a song's attributes indicate its genre?

Can we identify which attributes are the strongest in answering these questions?

## Data & WEKA

Data collected from the Million Song Dataset (MSD), a collection of one million commercial songs from 1911-2011.

Experiments run using WEKA, which is Machine Learning Software that contains visualization tools and algorithms for data analysis and modeling.

## Classification Results

### Decade Classification

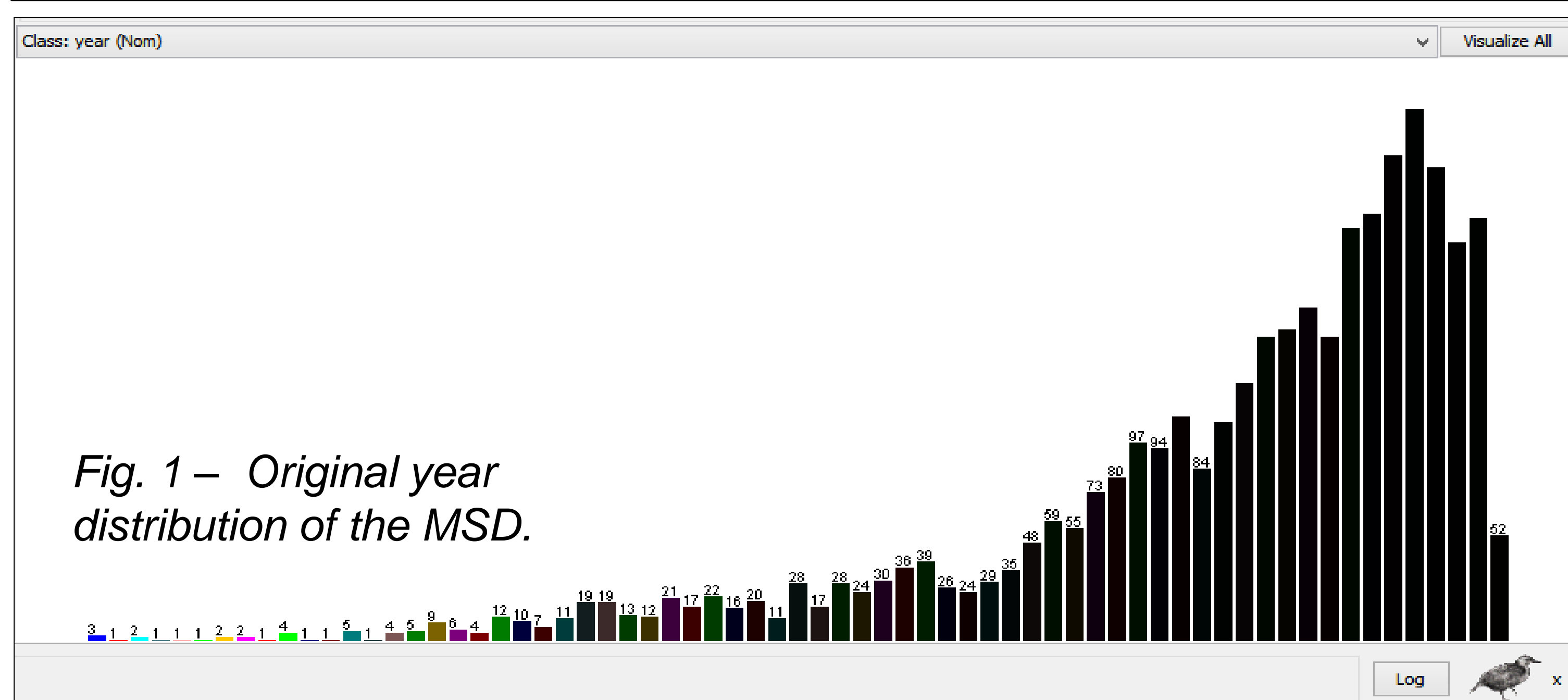
- Data was discretized into six decades: 1960-1970, 1970-1980, etc.

Baseline (Chance)	Descriptive Attributes	Timbre Attributes	Best Classifier
16.67%	31.87%	40.18%	RandomForest

### Genre Classification

- Ten total genres

Baseline (Chance)	Best Result	Best Classifier
10.00%	41.55%	BayesNet



## Attribute Selection

The MSD contains 53 descriptive attributes for each song, along with 90 timbre attributes. Attributes were removed if they were not good indicators of release year or genre, or if they were too closely tied to what was being classified.

### Ranked Descriptive Attributes

- Loudness (measured in decibels)
- Duration (in seconds)
- Tempo (estimated tempo in BPM)
- Time Signature (estimated beats per bar)
- Key
- Mode (major or minor)

**Timbre** is the quality of a musical note or sound that distinguishes different types of musical instruments, or voices. It is a complex notion also referred to as sound color, texture, or tone quality, and is derived from the shape of a segment's spectro-temporal surface, independently of pitch and loudness.

## Conclusions & Future Work

- Timbre Attributes are better predictors than descriptive ones.
- Related MSD sets, like the User Taste Profile and Tag Datasets, could help with both classification tasks.