# Harmony Across Genres: Exploring Muscial Relationships with Dimensional Reduction

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**Abstract**

## 1. Introduction

When looking for relationships between music, people often look for genres to carry the kind of musical energy that they are looking for, often being disappointed to find that many genres have a plethora of sounds and interpretations. Visualizing music catalogs helps to bring new ways to listen to music and find similarities between the sounds songs have[3]. A challenge often seen when trying to design visualizations of libraries and musical interfaces for sample exploration is the high dimensional nature of audio classification[1,2]. Both classification and regression problems can benefit from dimensional reduction of music, allowing for discovery and prediction of where a piece of music could be within a space[4]. Using different combinations of models, it is possible to create combinations and visualizations of music not thought possible without these techniques[3,5].

## 2. Methods

### 2.1 Data

Using the Spotify Web API* through a Python library, Spotipy , data from a library of tracks was downloaded, including their audio features , which outline information about a track, including:

| Feature | Description |
| --- | --- |

### 2.2 Models

## 3. Results

## 4. Conclusion

## 5. References

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