Ateneo de Manila University

Machine Learning with OPM (Original Pilipino Music)

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Research Groups

Ateneo Computational Sound and Music Lab

The ACSML aims to apply algorithmic and machine learning approaches on sound and music for analysis, computational tools assessment, methodology design, and generation.

Ateneo Laboratory for Intelligent Visual Environments

ALIVE aims to improve the detection and classification of objects using image processing and machine learning methods through the use of digital images with implementations on biomedical related applications, traffic and pedestrian monitoring and surveillance.

Research Examples

- Building an Initial Fitness Function Based on an Identified Melodic Feature Set for Classical and Non-Classical Melody Classification. ICISA 2013: 1-4
- Evolutionary algorithm-based composition of hybrid-genre melodies using selected feature sets. IWCIA 2016: 51-56
- Towards Automated Counter-Melody Generation for Monophonic Melodies. ICMLSC 2017: 197-202
- Reproducing Musicality: Detecting Musical Objects and Emulating Musicality Through Partial Evolution. ICAIIC 2019: 14-18
- An Analysis of Queen's Discography Using Unsupervised Learning Based On Full and Reduced Musical Feature Sets
- ***Music Subgenre Classification on OPM Music***

Music Subgenre Classification on OPM Music

- The **first step** towards the generation of music that can be classified as OPM (Original Pilipino Music)

The Problem with “OPM” as a commercial genre

- The **definition** of OPM is **not consistent**
- There are **2 perspectives**
  - Music (pop, rock, dance, hip-hop, etc) that is original and composed/produced in the Philippines **is referred to as OPM**
  - OPM refers to **popular contemporary music** that has strong elements of vintage Filipino music (i.e. folk music), particularly the **kundiman** and the **harana**

Challenges

- **Available metadata** on the music tracks may **not always be the best musical features** needed for an effective dataset for content-based music analysis
- Extracting values from the music content itself (non-lyrical examples: **melodic intervals, arpeggiation, repeated notes, chromatic motion, melodic information (i.e. fraction of tritones, fifths, sixths, etc) , note density, rhythmic information etc) requires the acquistion of the actual music track**
  - There are **legal** issues with regards to acquiring the actual tracks

A Side Note

On Indigenous Filipino Music

The availability of a machine-learning-ready dataset of indigenous FIlipino music **is still being developed**

Government and Academic agencies currently have a database of indigenous music **sounds**

Research in Progress

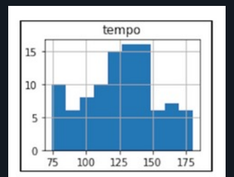

Figure 6. Tempo of Sample Songs

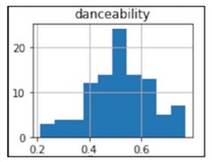

Figure 7. Danceability of Sample Songs

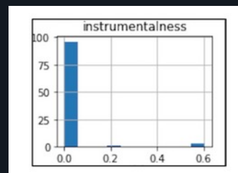

Figure 2. Instrumentalness of Sample Songs

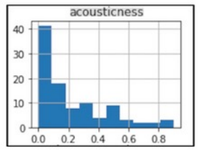

Figure 3. Acousticness of Sample Songs

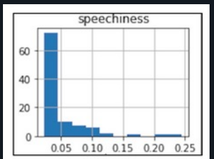

Figure 4. Speechiness of Sample Songs

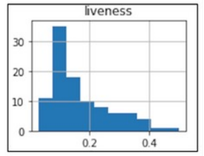

Figure 5. Liveness of Sample Songs

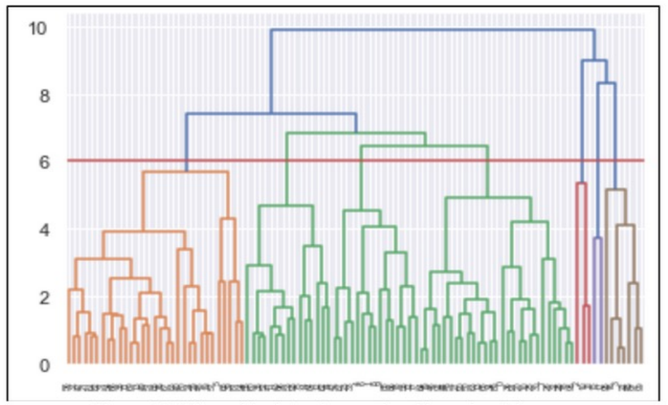

Figure 13. Hierarchical Agglomerative Clustering Diagram

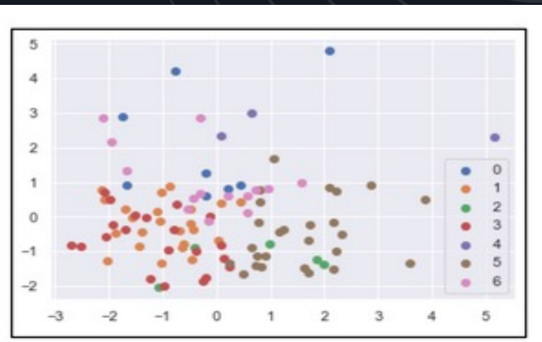

Figure 14. KMeans Clustering Plot

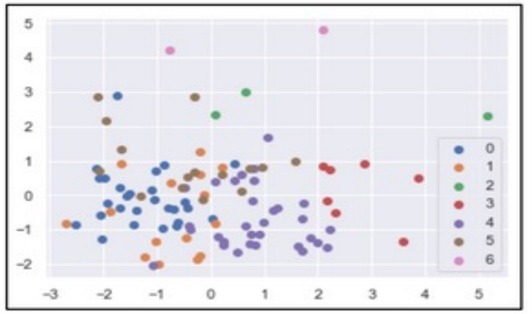

Figure 15. HAC Clustering Plot

The Workaround

Limiting the research using available music metadata provided by the Spotify Web API

- The researchers **built their own dataset** using Python libraries interfacing with the **Spotify Web API.**
- Available features and values:
  - Acousticness
  - Danceability
  - Energy
  - Instrumentalness
  - Liveness
  - Loudness
  - Speechiness
  - Key
  - Mode
  - Time Signature

The Workaround

- Acousticness
- Danceability
- Energy
- Instrumentalness
- Liveness
- Loudness
- Speechiness
- Key
- Mode
- Time Signature

vs.

- Melodic information
  - intervals
  - arpeggiation
  - repeated notes
  - etc
- Chords/Vertical interval info
  - Ave num of simultaneous pitch classes
  - partial chords
  - standard triads
  - etc

Future Actions, Further Investigations

- Towards a **legal way to acquire actual OPM music tracks** for research
- On indigenous music: collaborative efforts in **building a database of indigenous music** (i.e. not just a database of indigenou sounds)
- Ideas **borrowed** from our **Computer Vision** (ALIVE) **lab**:
  - Gen AI to **increase the number of samples**
  - **Augmentation** of existing samples
  - The above solutions are **controversial** because:
    - Gen AI **does not necessarily reflect accurate real world representations**
    - Augmentation **makes the model more robust rather than being able to compensate for lack of data**
    - These approaches are explored in computer vision, **but not as much in the context of music**

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Thank you!

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