Melody Generation: Rule Based vs Hidden Markov Models

Introduction

Melody generation is a field of research that hasn't exp certain models fully, e.g. Hidden Markov Models (HMN

Motivation

We believe the success of the tri-gram language mode be explored in the context of melody generation while considering a rule based model

Rule Based Model

- Progressive Embellishment Approach
- Iterates over inputted melody, outputting more intricate melody each iteration
- Melody notes outputted as tuples [MIDI Number, Note Length]
- Parameters:
 - Intricacy
 - Number of embellishing iterations
 - Chordal Complexity
 - Number of chords in base chord progression
 - Scale/Tonal Center
 - Facilitates conversion of scale degrees produced by the model to actual notes

Implementation Details

For 1:Complexity:

Generate whole note s.t. no repeated notes, last in sequences is IV or V

For 1:Intricacy - 1:

for each note in current sequence

with some probability P:

replace note with two evenly divided notes of differe pitches

Replace outputted notes with MIDI values based on Key a Scale

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	1st	1st-order matrix				2nd-order matrix			
	Note	Α	C#	E۶	Notes	Α	D	G	
	Α	0.1	0.6	0.3	AA	0.18	0.6	0.22	
	C#	0.25	0.05	0.7	AD	0.5	0.5	0	
	E۶	0.7	0.3	0	AG	0.15	0.75	0.1	
					DD	0	0	1	
					DA	0.25	0	0.75	
					DG	0.9	0.1	0	
					GG	0.4	0.4	0.2	
					GA	0.5	0.25	0.25	
					GD	1	0	0	
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Dataset- The Meertens Tune Collection (2018)

- 18,618 MIDI tunes
- Monophonic melody files

Summary

- more time for data collection

Acknowledgements

- You Zhang for your advice





Sourced from Dutch folk songs, written sources Limited scope of data sources limits model training

The tri-gram language model was successfully adapted for use to train a model for melody generation

Subjective analysis of the results is difficult and requires

Hybridization of the rule based model and the HMM model requires more sophistication and testing

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UNIVERSITY of **NHESTER**