



MUSIC SIMILARITY EVALUATION USING MACHINE LEARNING METHODS AND SIGNAL PROFILES

GOAL:

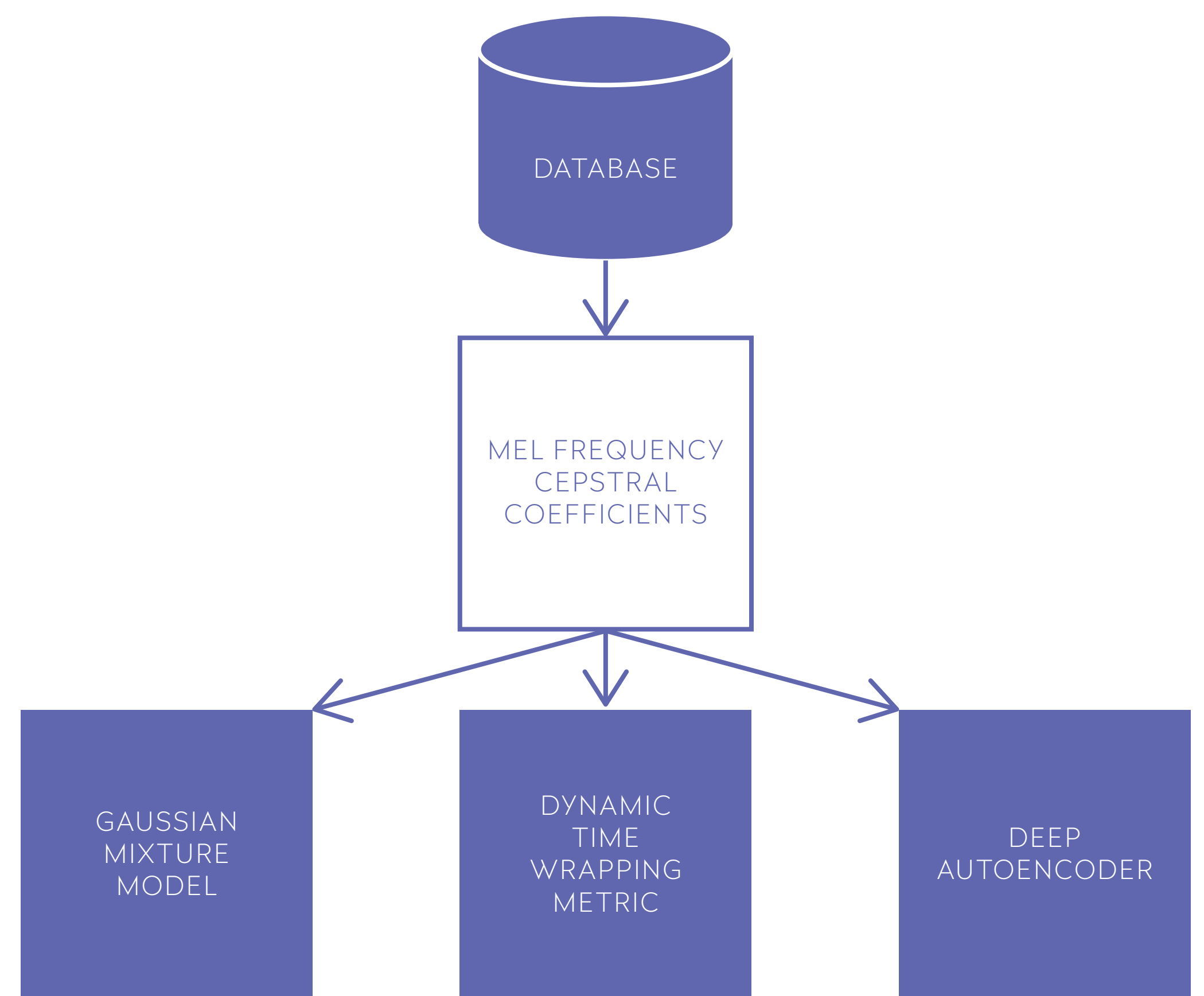
Create a methodology for similar music detection based entirely on audio signal properties.

DATASET:

Experiments were performed on a database consisting of 2511 most popular songs from 10 different genres.

Genre	Number of songs
Pop	275
Rock	246
Metal	236
EDM	257
Kpop	265
Country	236
Classical	203
Jazz	252
Blues	253
Rap	288

METHODS:



FUTURE WORK:

We are planning to apply more difficult deep learning models, such as variational autoencoders and transformers with self-attention mechanisms to create proper audio embeddings for the signals.

EVALUATION:

The recommendation system was evaluated using two methods:

1. Finding the number of same genre, album and artist as the query had in the top 50 recommended songs
2. Comparing algorithms ranking results with the music similarity ranking scores given by the group of experts.

Figure 1. The number of the same genre, album and artist songs in the recommended list

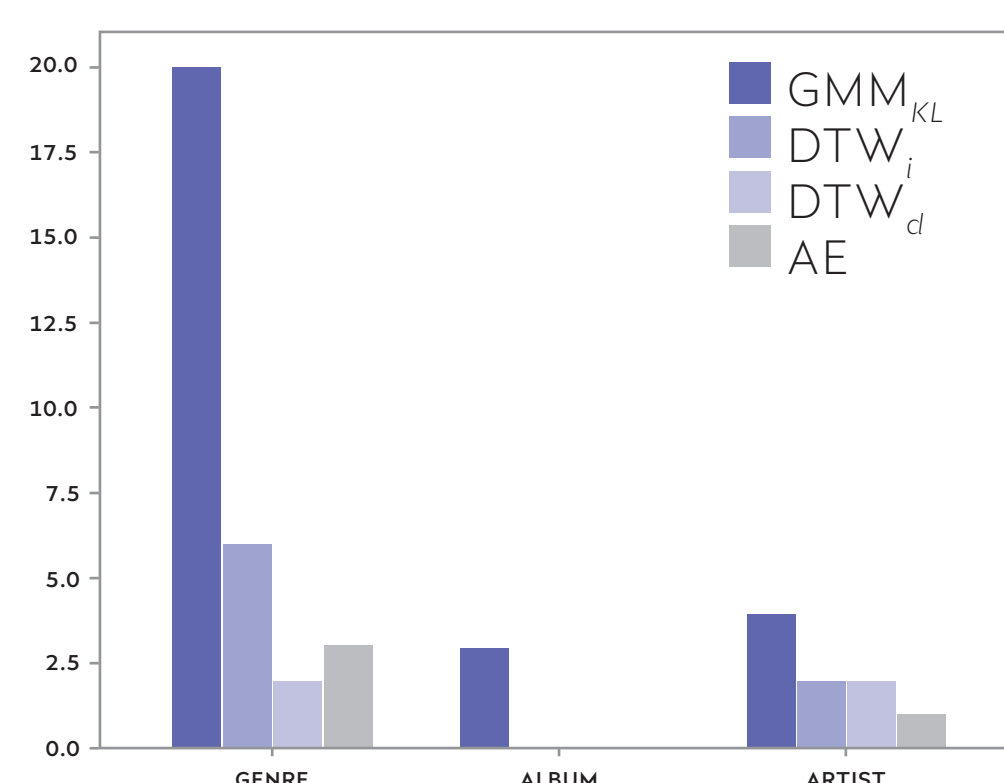
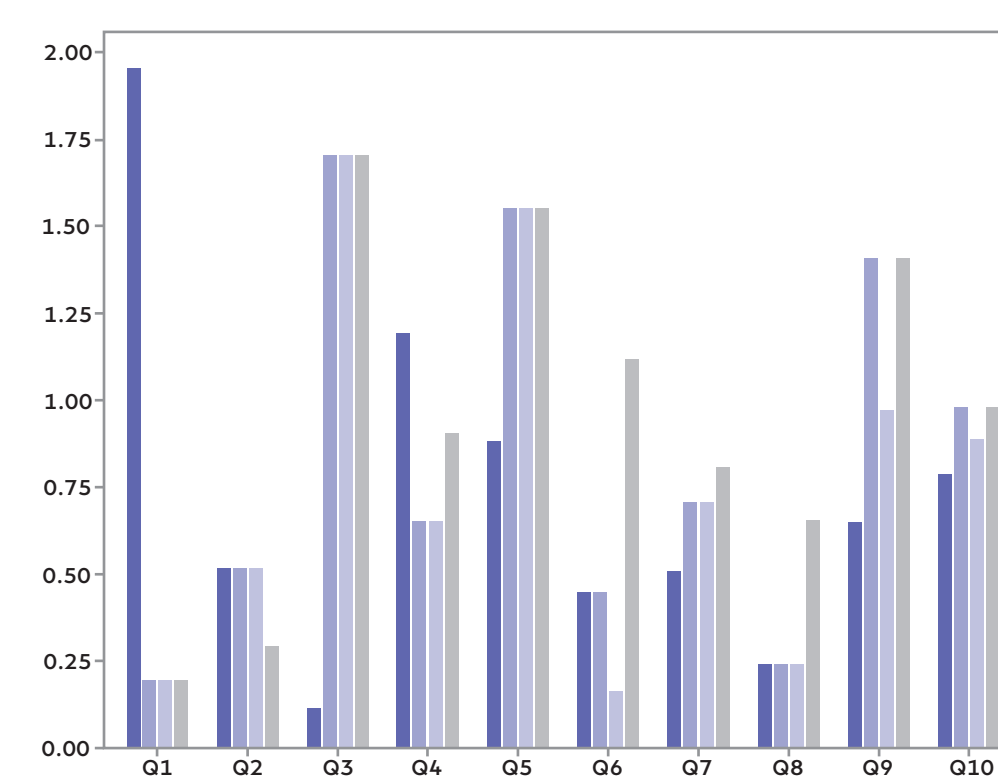


Figure 2. Mean square error (MSE) between the models and the group of experts ranking results (left) and average MSE evaluation for each model (right)



Method	MSE
GMM _{KL}	0.7345
DTW _i	0.8452
DTW _d	0.7632
AE	0.9605

	GMM _{KL}	DTW _i	DTW _d	AE
GMM _{KL}	1.000	-0.319	-0.281	-0.469
DTW _i	-0.319	1.000	0.959	0.881
DTW _d	-0.281	0.959	1.000	0.795
AE	-0.469	0.881	0.795	1.000

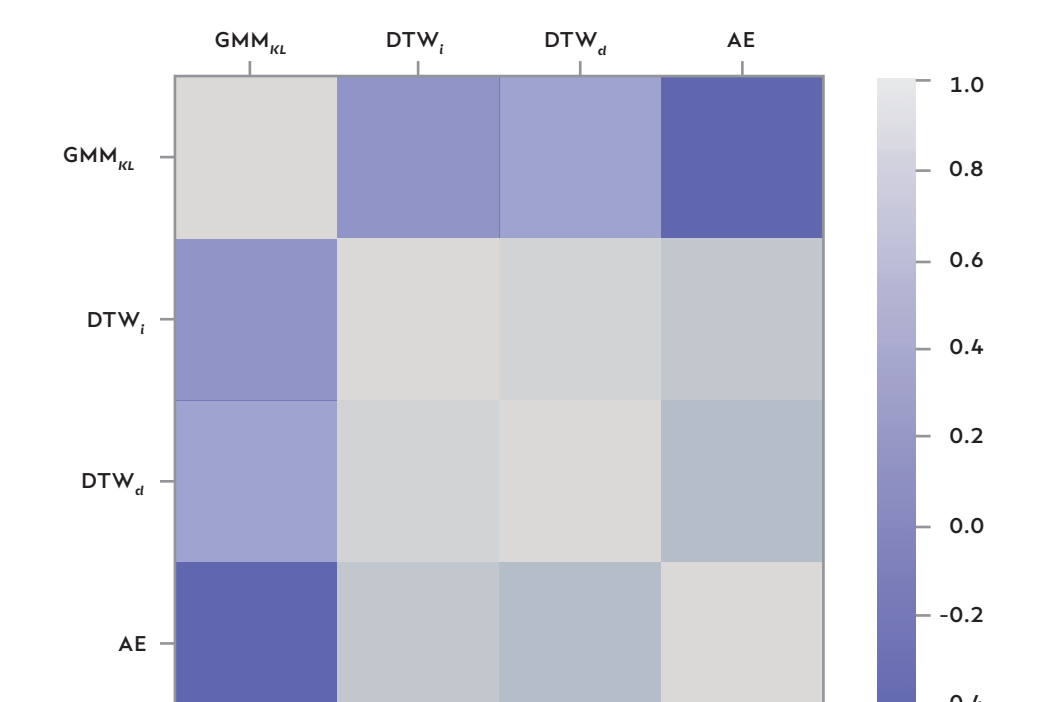


Figure 3. Correlations between each method recommendations

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CARD

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