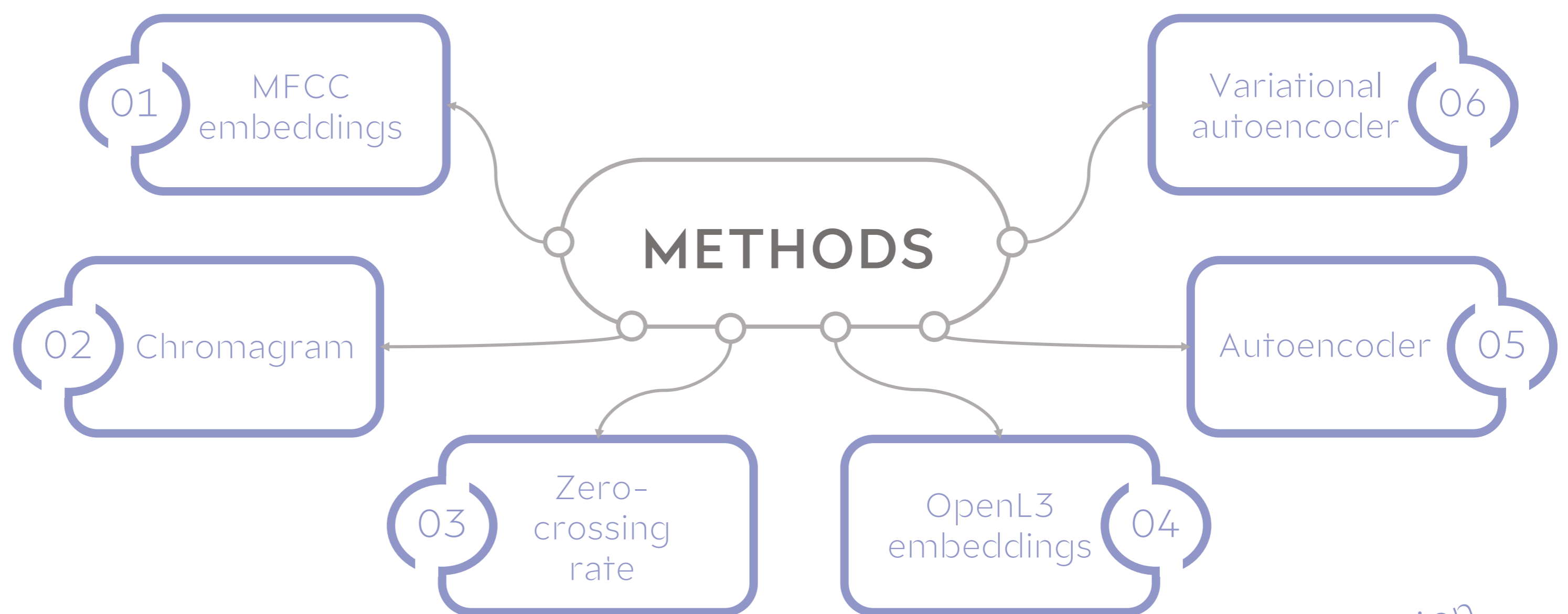




# RECOMMENDING MUSIC USING MUSIC INFORMATION RETRIEVAL METHODS AND DEEP LEARNING



Evaluation survey

## AIM OF THE RESEARCH

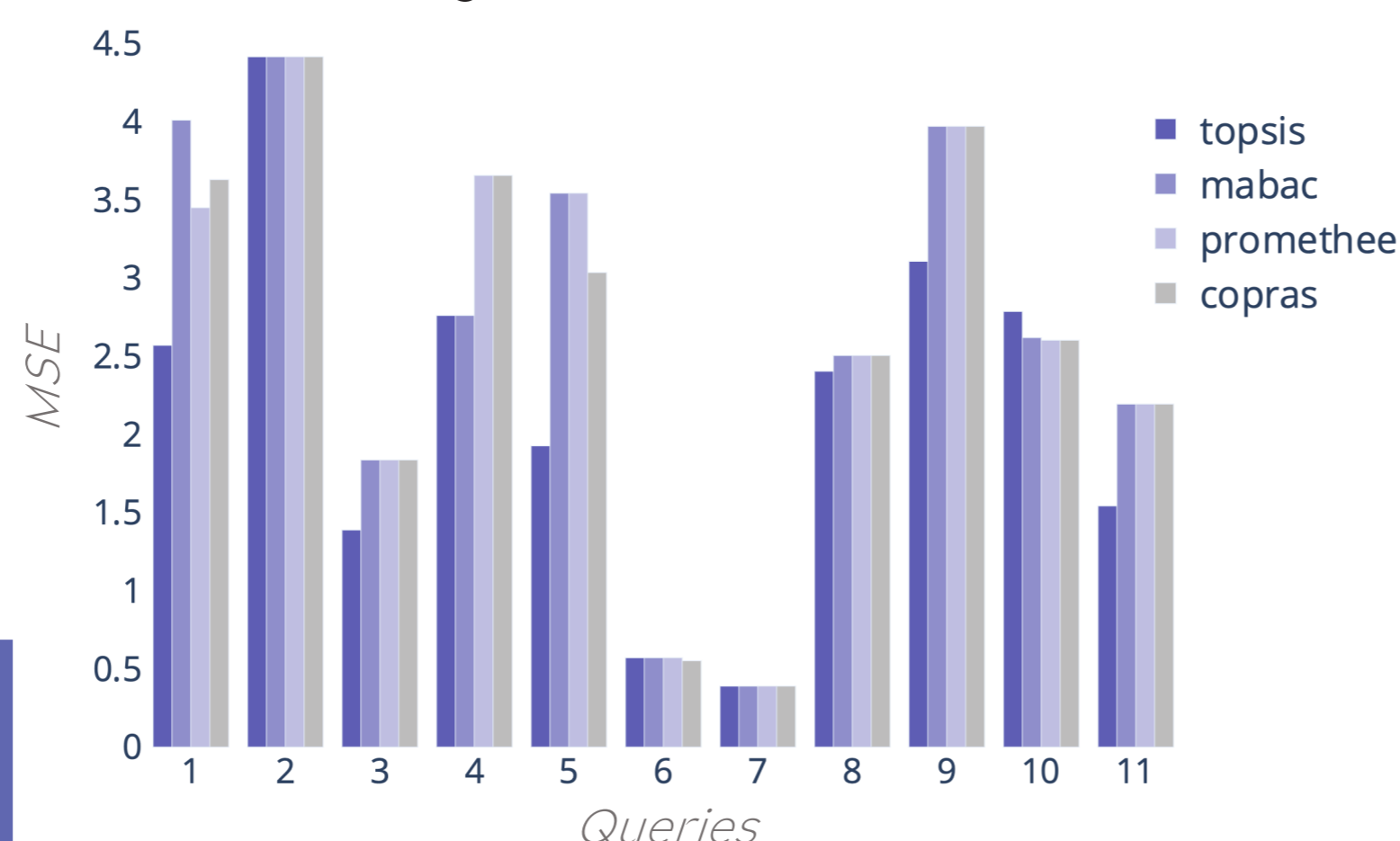
- The aim of this research is to create a music recommendation method based on audio signal properties.
- For this, six different audio features extraction methods were combined into one recommender system.

## DATASET

- 4039 royalty free songs from 11 genres were used for this research.
- Each song was cut into 15 s. clips, each overlapping by 5 s. in order to avoid the difference in lengths. The final number of these clips were 114 433.
- The songs were crawled from *Pixabay* royalty free database.

## RANKING RESULTS

The methods were combined using *Topsis*, *Mabac*, *Promethee* and *Copras* ranking algorithms. Each ranking method was compared to human evaluation survey results by calculating MSE between the ranking vectors.



## CONCLUSIONS

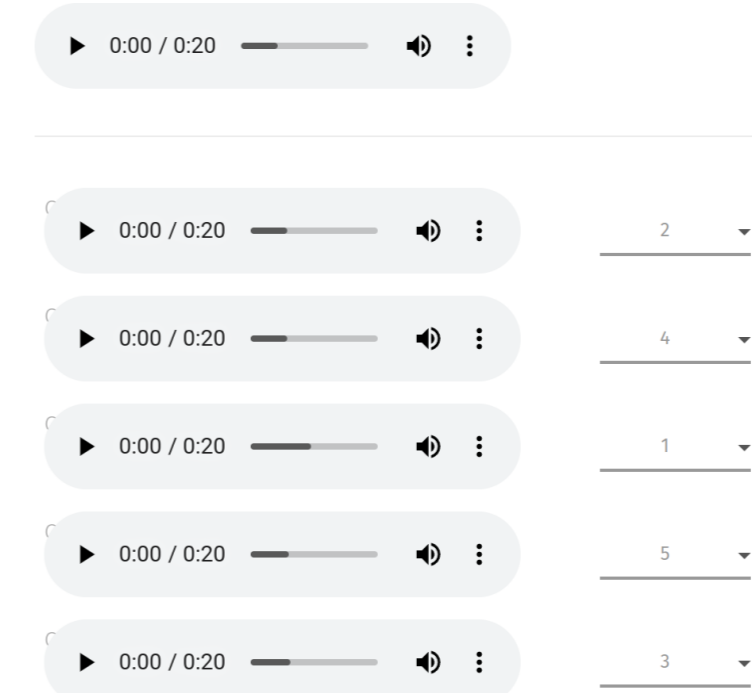
- The created music recommendation system had six integrated audio embeddings models, which were combined with weights by the TOPSIS ranking method.
- The most influential models were Autoencoder, MFCC embeddings and Zero-Crossing rate.

## HUMAN EVALUATION

To capture human perception of music similarity, we created music ranking a survey.



Group1. Rank from the most similar to the least similar:

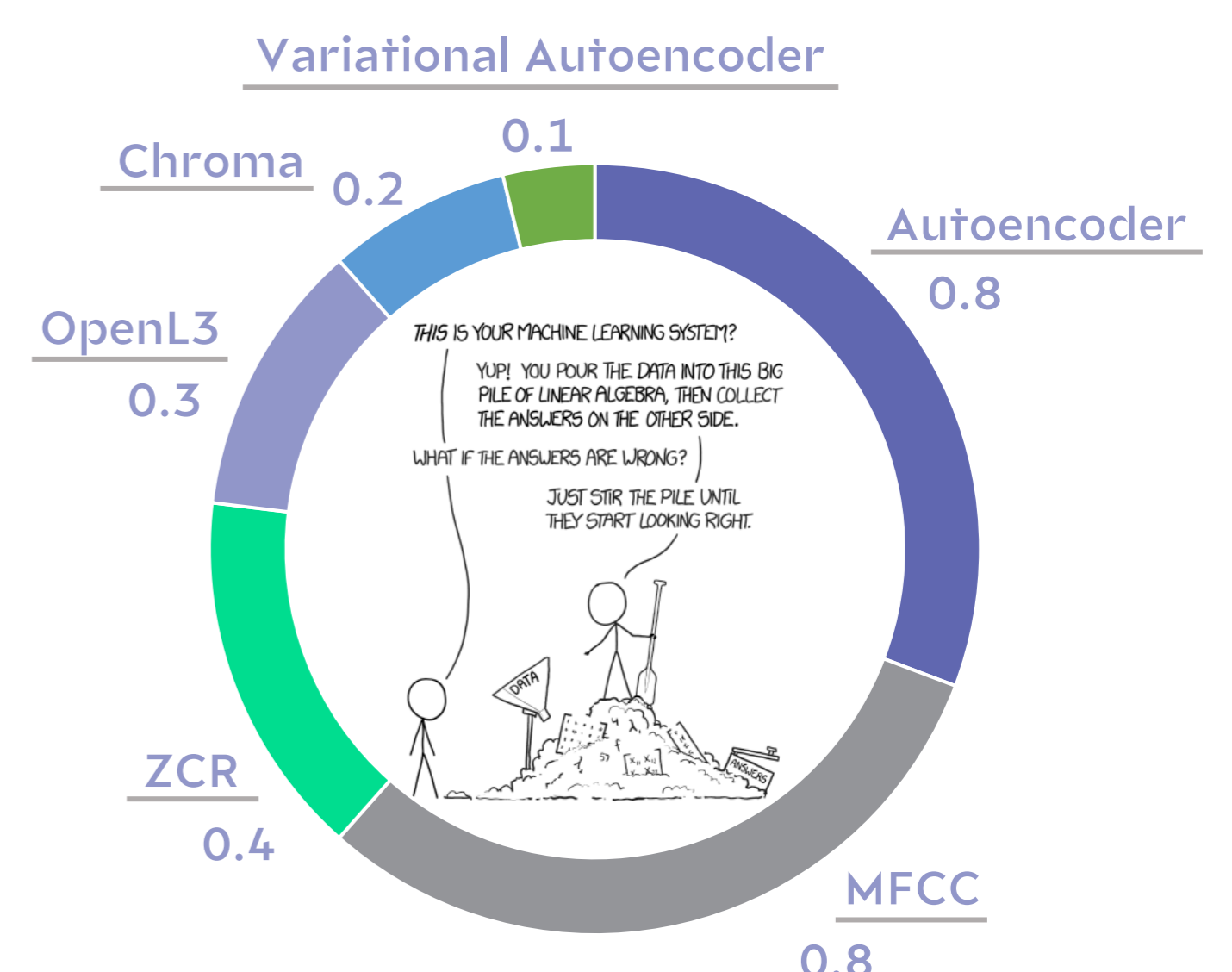


The survey had:

- 11 queries with 5 choices to rank.
- Each query captures different genre.
- 27 participants.

## RECOMMENDATIONS OPTIMISATION

The ranking weights for each audio features extraction model were optimized using simple Grid Search hyperparameter optimization method. The final recommendation system had six audio features extraction models with the following weights:



## FUTURE PLANS

- This audio recommendation model currently is only tested with music. In the future, it is planned to include other types of audio databases as well.
- It might be useful to add even more different audio embeddings models or add more various human evaluation tests.

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# CARD

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