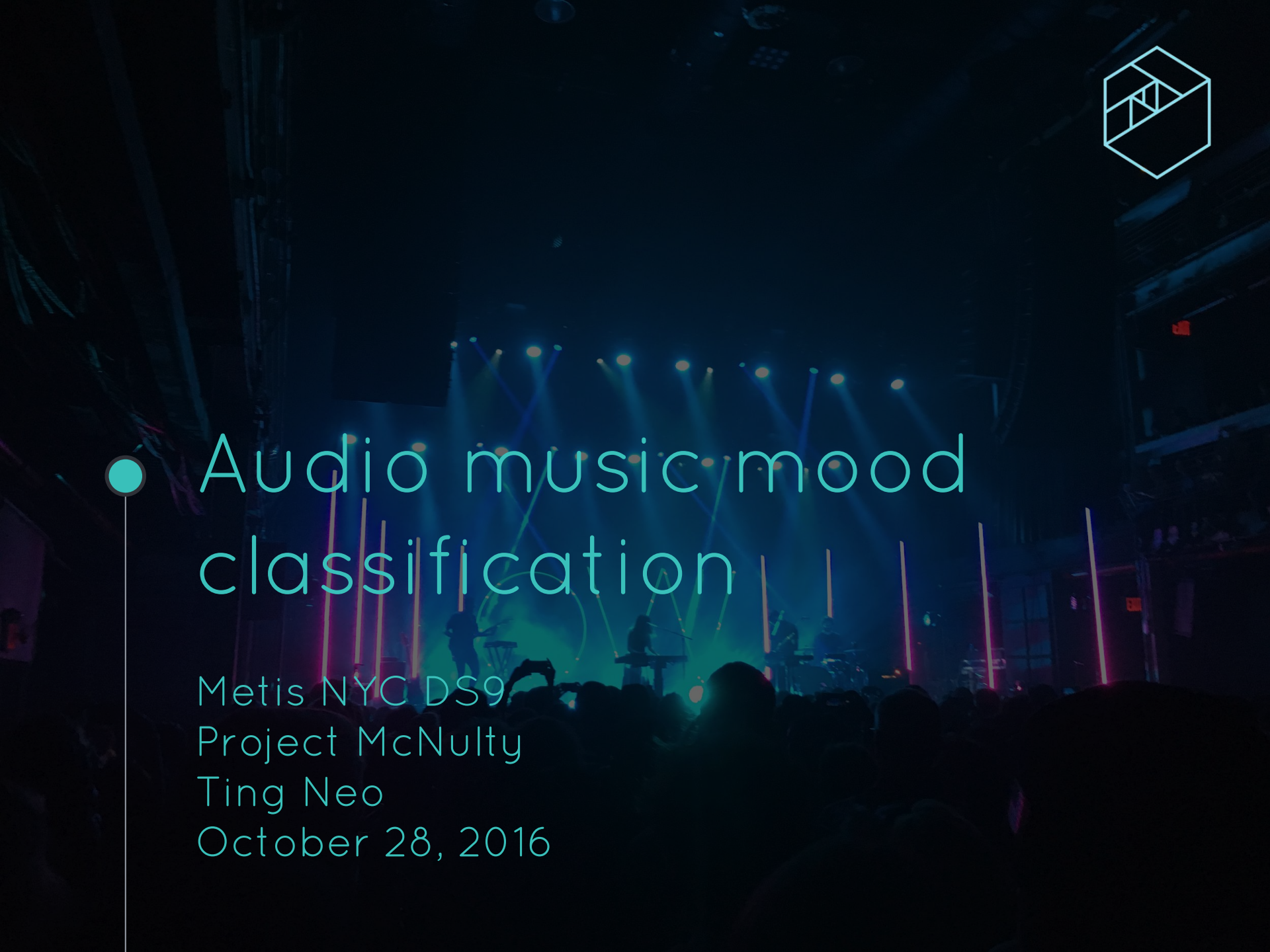


Audio music mood classification

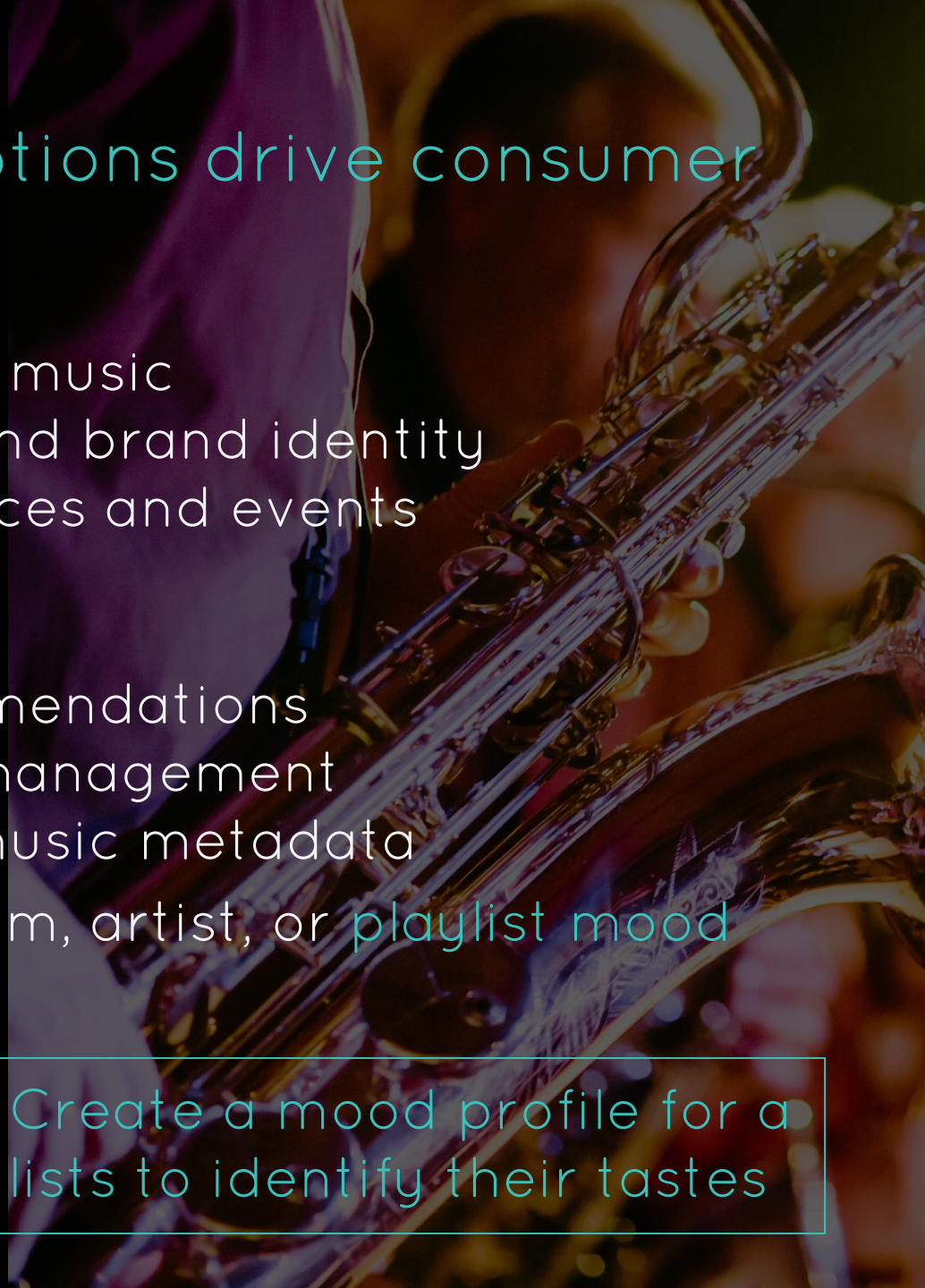
Metis NYC DS9
Project McNulty
Ting Neo
October 28, 2016

Moods and emotions drive consumer decisions

1. Association with music
   a. Advertising and brand identity
   b. Music for spaces and events

2. Music industry
   a. Music recommendations
   b. Label/artist management
   c. Assembling music metadata
   d. Creating album, artist, or playlist mood profiles

Business objective: Create a mood profile for a user's Spotify playlists to identify their tastes

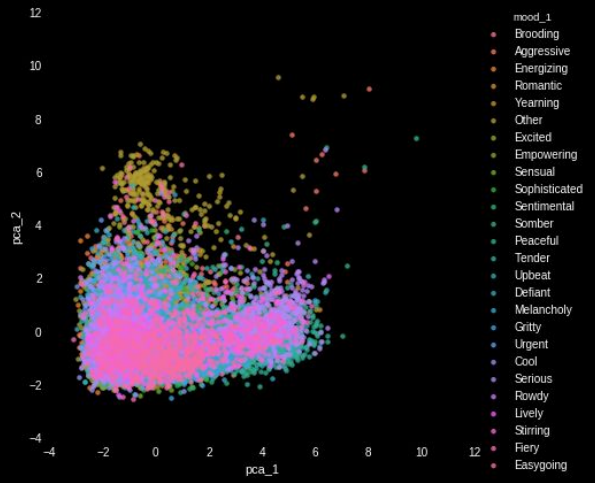


Identifying song features and labels

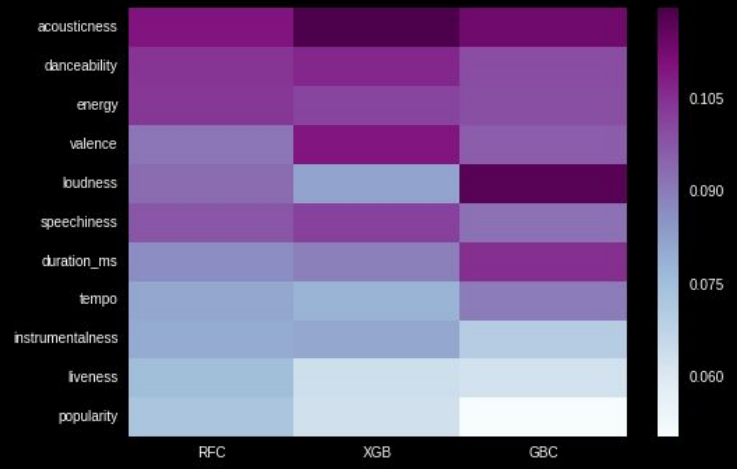
Compiled database of 21,059 songs with mood labels

Trial and error to determine the best process

- Feature engineering: Scaled Spotify audio features emerged as the best predictors
  - Explored interactions and PCA

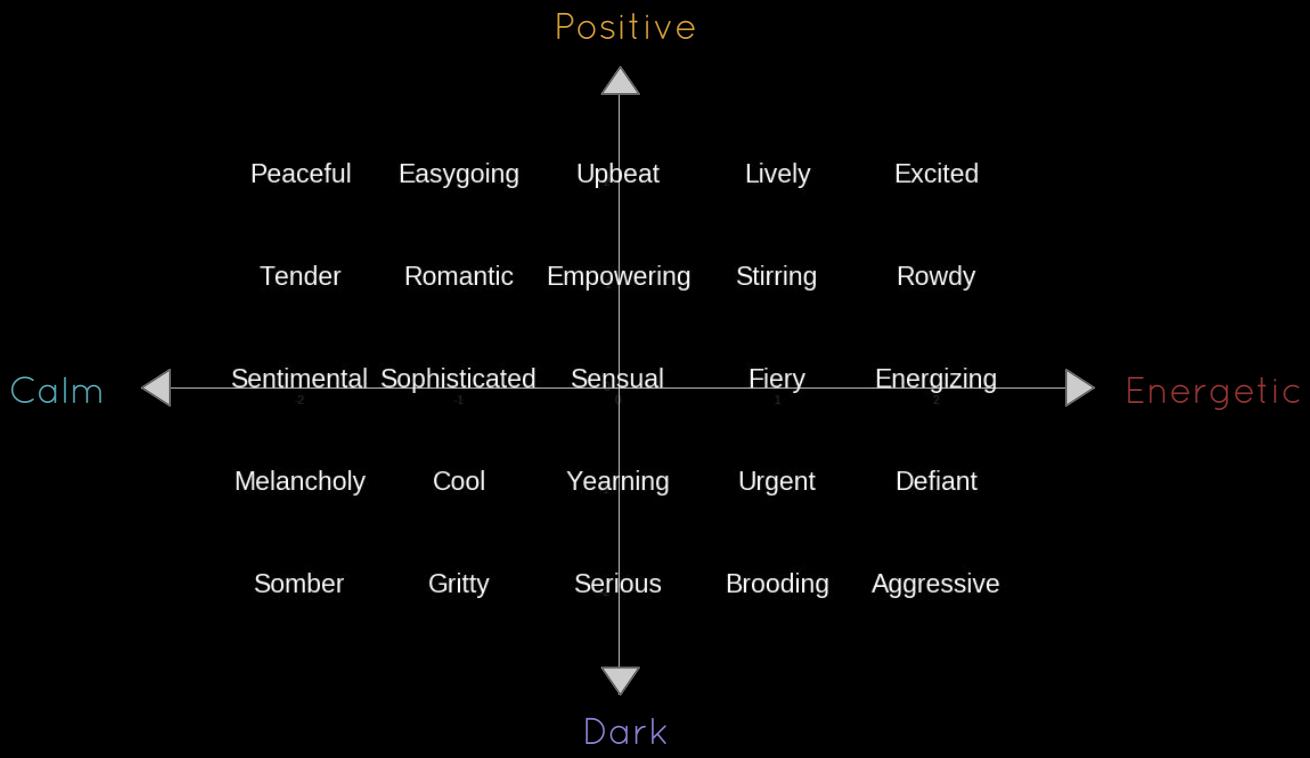


- Models: Random Forests, Gradient Boosted Trees and XGBoost performed best
  - Random Forests consistently outperformed other models (w/ n estimators = 300)



Mood taxonomy is defined on an arousal-positivity scale

- Deconstruct the problem into one of predicting level of arousal, level of positivity, then using coordinates to predict mood class
  - Arousal and positivity defined on a scale of -2 to 2
  - From one 25-class problem to two 5-class problems?



Evaluating two approaches to multinomial classification

Predict all moods at once, assuming no relationship

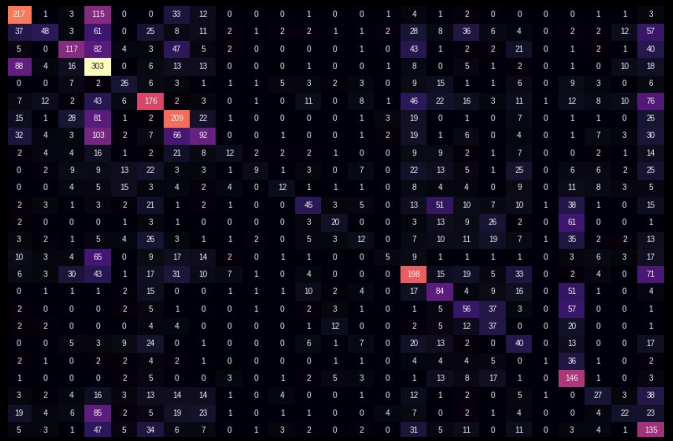
- One 25-class problem
- Model: Random Forest

Precision	Recall	F-1
0.37	**0.37**	**0.36**

- Emergence of TP/TN diagonal in confusion matrix, as well as FP/FN in similar moods

Predict arousal and positivity separately, use intersection for mood

- Two 5-class problems
- Model: Random Forest



Precision	Recall	F-1
0.35	**0.32**	**0.30**

- Arousal and positivity models individually hit relatively high precision scores of 0.57 and 0.48

Playlist mood profile app demo

Ideas for next steps and future work

App

- Incorporate additional interactivity and data views
- Incorporating Spotify logins and authorizations so users can view and evaluate their own playlists
- Go live and make backend robust

Modeling

- Incorporating lyrics, topics and sentiment
- Approach mood identification as a clustering problem based on audio features

Thanks!

Any questions?

You can find me at

neo.kaiting@gmail.com

github.com/neokt