

# Data Exploration Phase

## Team Oatmeal:

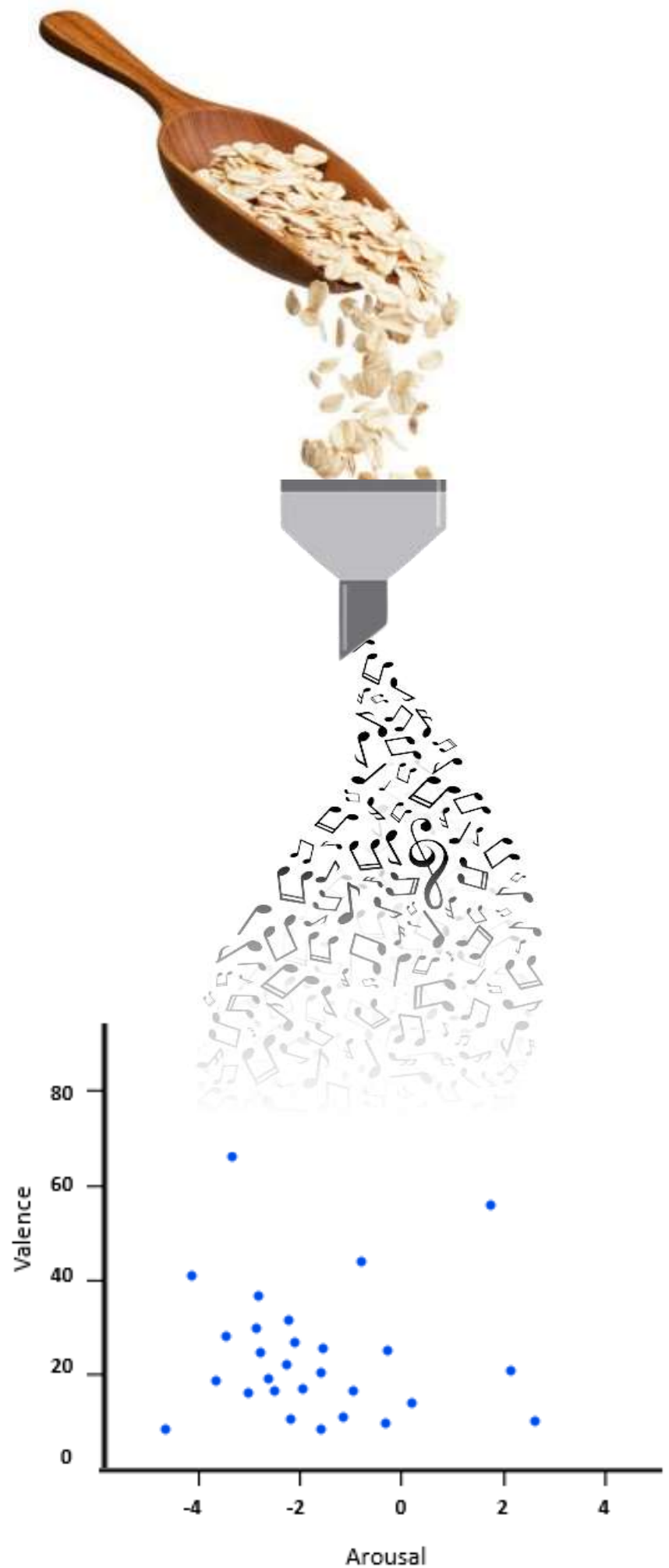
David Kürsteiner

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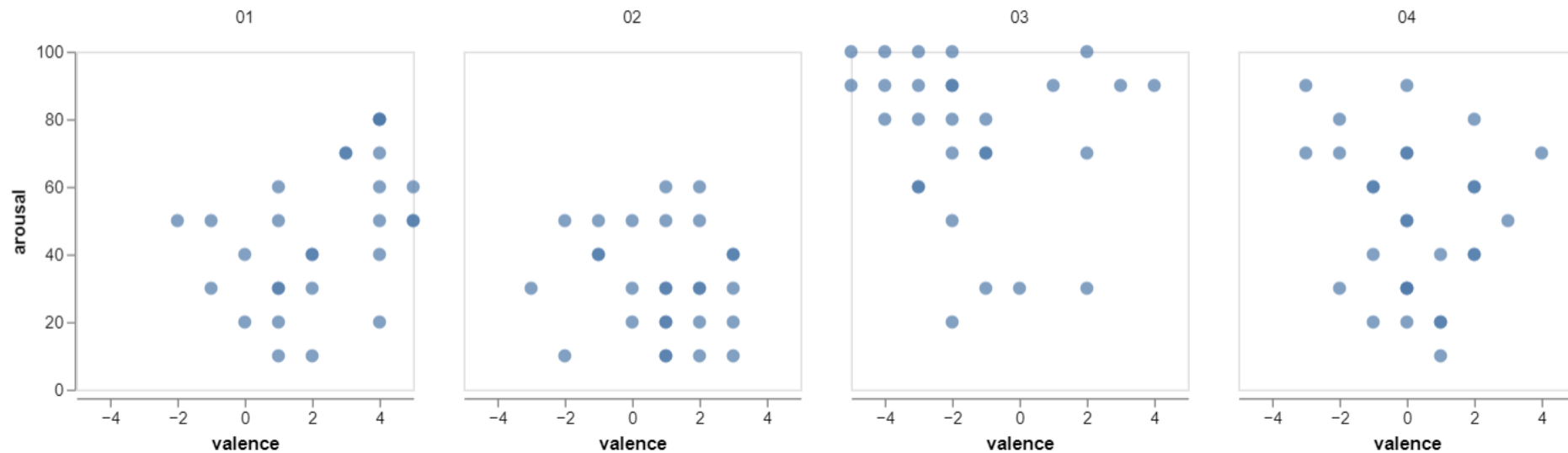
Elias Ramoser

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# Annotation consistency

- Annotators have common tendencies but are not in general agreement
- Most likely due to the subjectiveness of music emotion
- Annotations can be averaged out and are therefore still useful



Annotation distribution of four samples

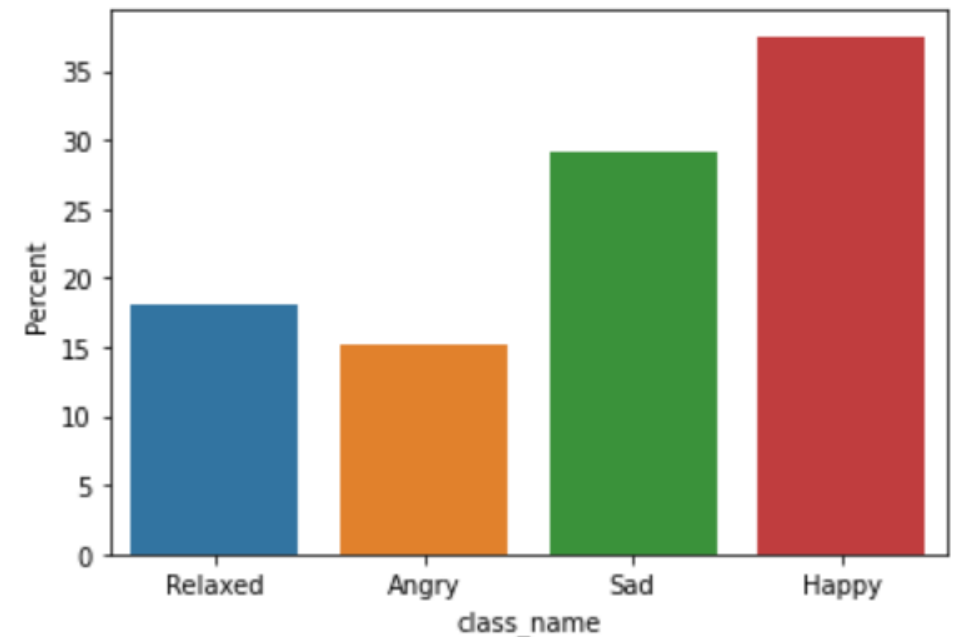
# Discrete class labels

- Set class labels as Angry, Happy, Sad and Relaxed
- Aggregate conflicting annotations by median to punish outliers
- Split classes as follows:

| Emotion | Valence  | Arousal   |
|---------|----------|-----------|
| Angry   | $\leq 0$ | $> 50$    |
| Happy   | $> 0$    | $\geq 50$ |
| Sad     | $< 0$    | $\leq 0$  |
| Relaxed | $\geq 0$ | $< 0$     |

# Class label distribution

- Class labels are not evenly distributed but imbalance not too severe
- Moving classification borders can eliminate imbalance but might lead to loss of information
- Otherwise a stratified train-test split can be used to deal with dataset imbalance



Class label distribution

# Feature correlations

- Few features highly correlated (e.g. spectral analysis coefficients)
- Makes sense to aggregate these highly correlated features
- Surprisingly data shows that minorness is not correlated with valence/arousal and therefore class labels
- Features most correlated to valence/arousal:
  - Essentia\_onset\_rate
  - Librosa\_bpm
  - Midlevel\_features\_melody
  - Midlevel\_features\_articulation
  - Midlevel\_features\_rhythm\_complexity

# Conclusions

- Inconsistency of annotations needs to be addressed
- Dataset imbalance might have to be addressed during classification
- Midlevel features as well as onset rate and bpm have highest correlation with class labels and are therefore the most promising candidates for the following classification task
- Loudness also affects the raw annotations
- Subjectiveness of music emotion is reflected in the data