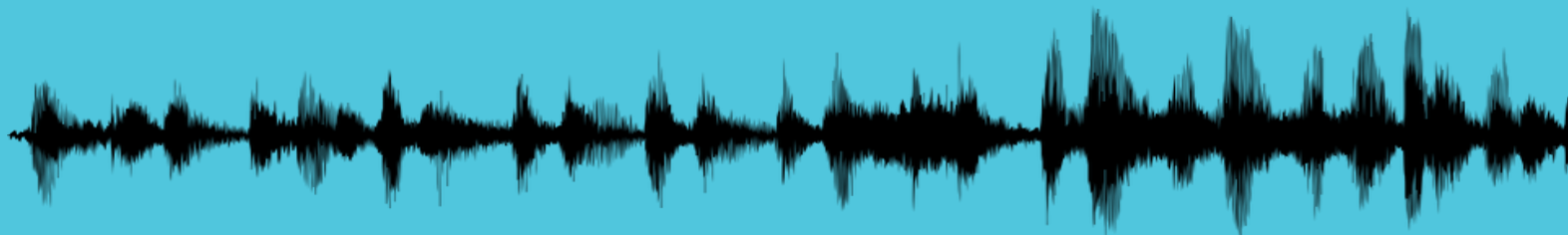# Disagreement Detection

## Spotify Project Group

*Connor Capitolo, Max Li, Morris Reeves, Jiahui Tang*
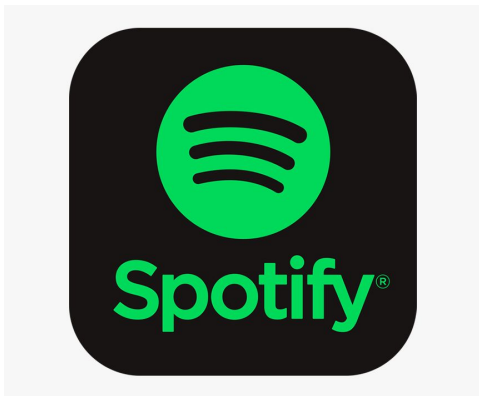
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**It is possible for a machine to identify disagreement in an audio file?**

# Why is disagreement detection in podcasts important & interesting?

- **Recommender System**
- **Matching User Preferences**
- Understand Narrative Arcs
- Build platform ecosystem

- **Better User Experience**
- **Higher Retention**
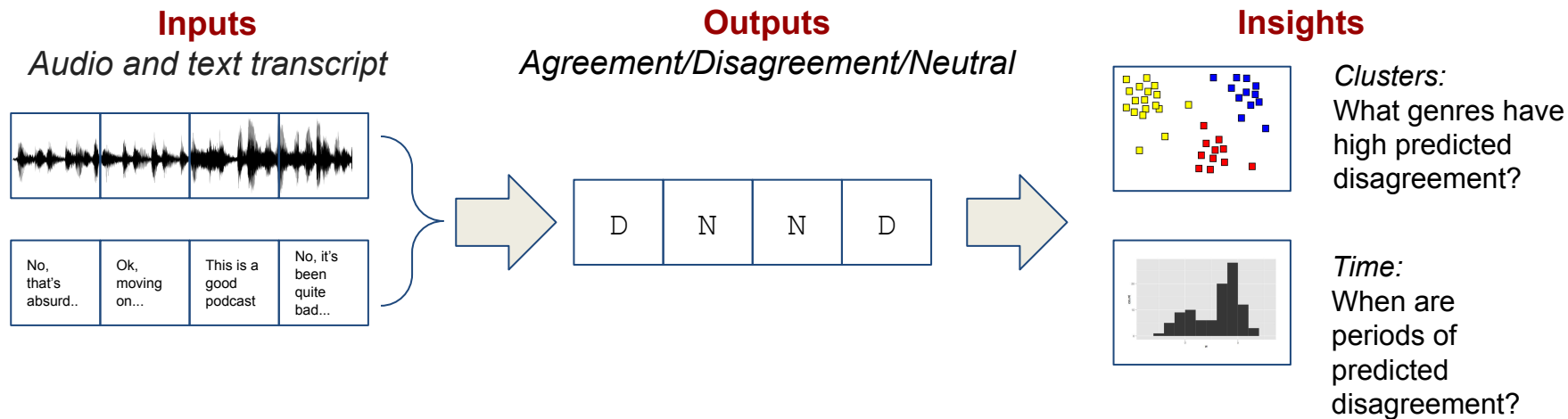- **Clear recommendations of controversial topics and genres**

- Improve style or moderation
- **Audio Search Engine Optimization**
- **Drive audiences traffic**

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# What are we trying to achieve?

Generate insights on unlabeled podcast audio and text data, given a small set of labels

**Inputs**
*Audio and text transcript*

| No, that's absurd.. | Ok, moving on... | This is a good podcast | No, it's been quite bad... |

**Outputs**
*Agreement/Disagreement/Neutral*

| D | N | N | D |

**Insights**

*Clusters:*
What genres have high predicted disagreement?

*Time:*
When are periods of predicted disagreement?

# But what is disagreement?

- Types:
  - **Dialogic**: interacting speakers: statement → response
  - **Non-dialogic**: 1 topic, 2 independent utterances
- Categories:
  - **Ordinal** (NN / N / O / P/ PP)
  - **Multiclass** (Disagree / Neutral / Agree)
- Granularity:
  - **Turn** (speech from single speaker)
    - **Utterance** (e.g. speech bounded by pauses)



Is this a 5 minute argument or the full half-hour.

# Spotify Podcast Dataset

- ~**100K podcasts**
  - ~ 50k hours of audio
  - > 600M words
  - English language specific
  - Professional + amateur creators

Dataset statistics

| | min | average | max |
|---|---|---|---|
| minutes | $<1$ | 31.6 | 305.0 |
| words | 11 | 5,728 | 43,504 |

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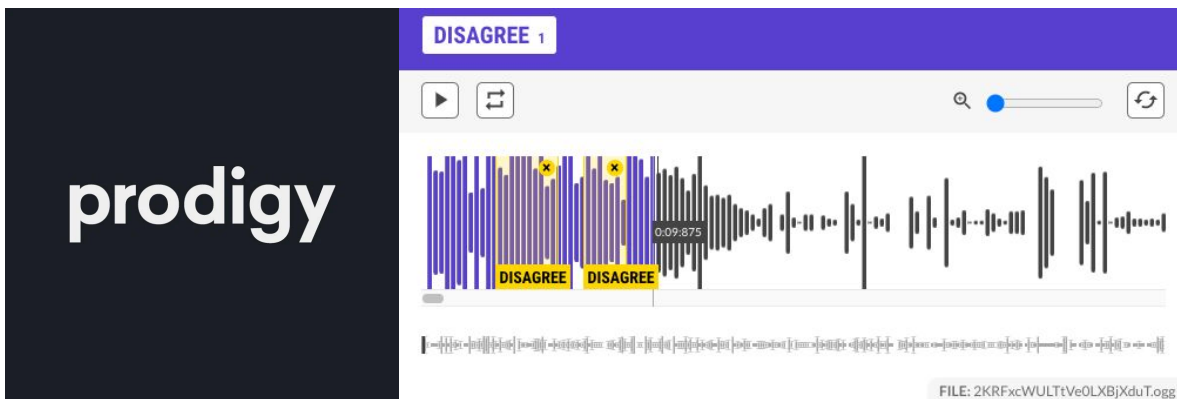**School of Engineering**
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# Spotify Podcast Dataset

- High-level directories
  - Audio (**~2 TB**)
  - Transcripts (~12 GB)
  - Metadata (~145 MB)

# How?

- **Audio annotation**
- **Exploratory data analysis and visualization**
- Text sentiment exploration
- Constructing disagreement detection model for audio data

# How?

- Audio annotation
- Exploratory data analysis and visualization
- **Text sentiment exploration**
  - **feature for predicting disagreement**
  - **genre clusters**
- **Constructing disagreement detection model for audio data**

# Thank You