A preliminary study on viewer sentiment analysis of social media videos
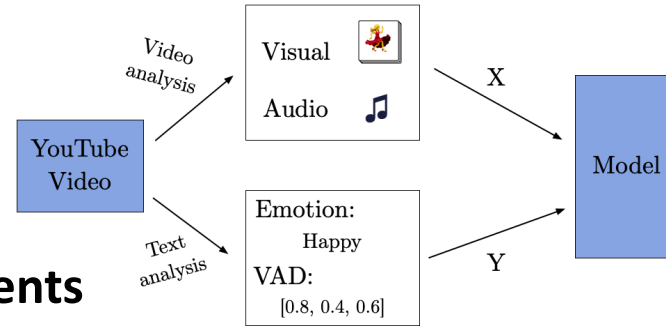
Marc A. Kastner, Shin'ichi Satoh

✉ **mkastner@nii.ac.jp**

NII

Motivation

- Purpose: Find scenes which are *funny, scary*, *sad …*
- Annotation expensive.
  No existing datasets!

- **Can we use user comments to cluster sentiment of videos?**

From comments to sentiment

Joyful comments
= Happy video?

Grieving comments
= Sad video?

- The comments are direct reactions to comments
  - Sentiment analysis of comments helps understanding videos
- Sentiment analysis to generate labels (majority decision)
  Emotion = {sad, **happy**, …}   VAD = { 0.1, 0.5, 0.3}
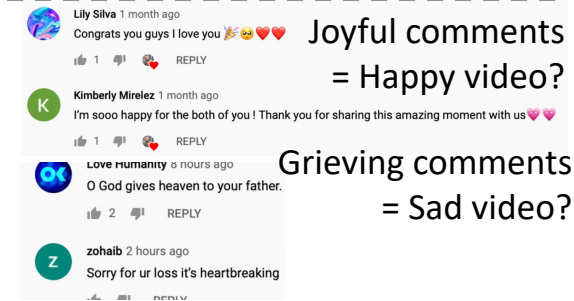
Approach

- Using videos from SNS (YouTube):
  - Crawl videos + their top-n comments
  - Analyze comments using NRC sentiment dictionaries
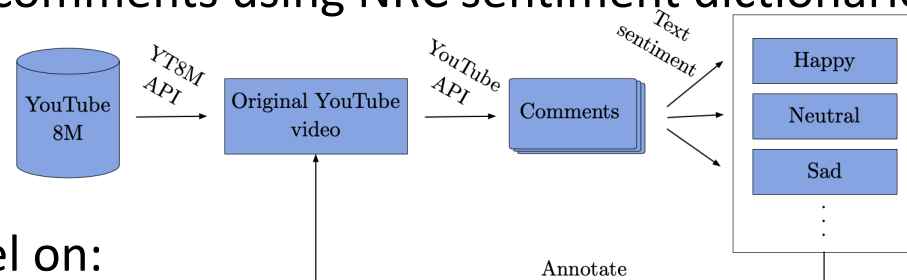
- Train model on:
  - X = [Visual features + Audio features]
  - Y = generated Emotion / VAD annotation

Experiments

- Dataset: 17,112 videos with generated Emotion/VAD from their top-100 comments
  - Train separate models for each

- Results
  - Works, but not enough data for some emotions
  - Dataset imbalanced

Table 1: Results for VAD estimation.

Features	Valence		Arousal		Dominance	
	MAE	Corr.	MAE	Corr.	MAE	Corr.
Visual	2.99	0.47	2.00	0.51	1.98	0.32
Audio	2.83	0.54	1.99	0.51	1.95	0.36
Combined	**2.84**	**0.55**	**1.95**	**0.55**	**1.93**	**0.38**

Table 2: Results for emotion estimation.

Features	Avg. Precision	Avg. Recall	Avg. F1 Score
Visual	0.30	0.39	0.28
Audio	**0.36**	**0.41**	**0.34**
Combined	0.33	**0.41**	0.31

A preliminary study on viewer sentiment analysis of social media videos

Marc A. Kastner, Shin'ichi Satoh ✉ **mkastner@nii.ac.jp**

NII

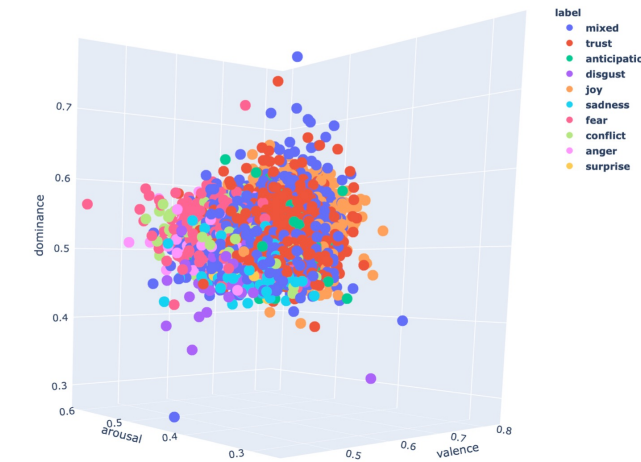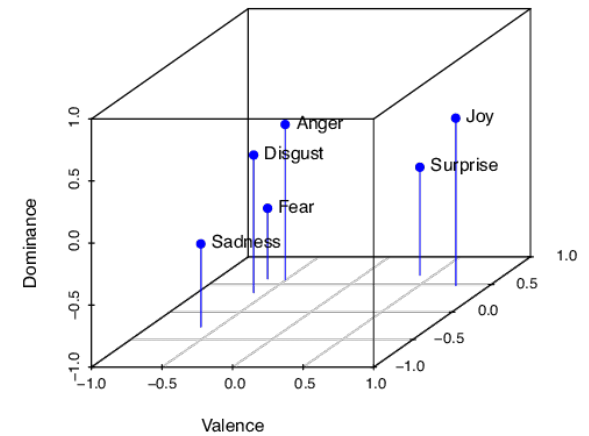## Next steps

- Improve features
  - RGB / Audio currently simple average over all frames (Switch to RNN model)
  - Include audio sentiment, music mood, etc.
- Train separate models for different categories
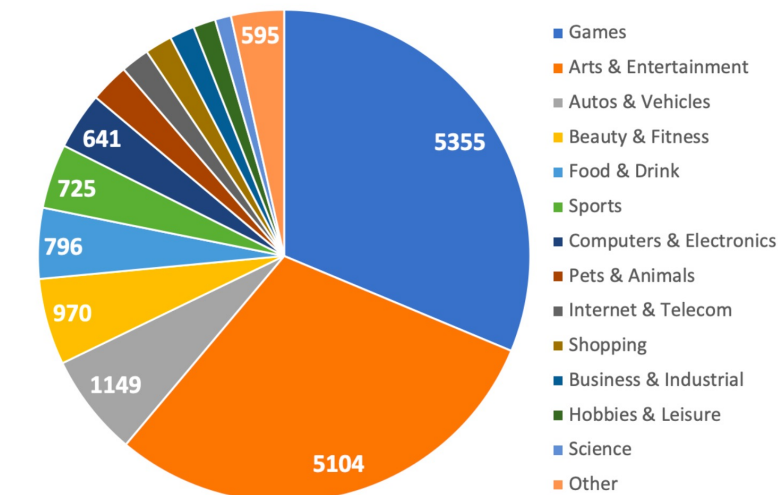 - *Can we find per-community sentiment models?*
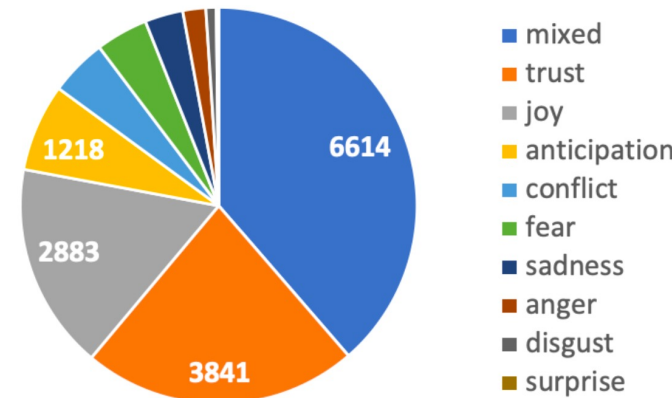
Emotion

Relationship Emotion <> VAD

Our dataset

Dataset composition

Categories of videos

Generated emotion distribution

Legend (pie chart of categories): Games, Arts & Entertainment, Autos & Vehicles, Beauty & Fitness, Food & Drink, Sports, Computers & Electronics, Pets & Animals, Internet & Telecom, Shopping, Business & Industrial, Hobbies & Leisure, Science, Other

Values: 5355, 5104, 1149, 970, 796, 725, 641, 595

Legend (emotion distribution): mixed, trust, joy, anticipation, conflict, fear, sadness, anger, disgust, surprise

Values: 6614, 3841, 2883, 1218

Used datasets

- Sentiment dictionaries
  - [1] Crowdsourcing a Word-Emotion Association Lexicon, S. M. Mohammad and P. Turney, Computational Intelligence, 29 (3), 436-465, 2013
  - [2] Obtaining Reliable Human Ratings of Valence, Arousal, and Dominance for 20,000 English Words. S. M. Mohammad. ACL 2018.
- YouTube video dataset:
  - [3] YouTube- 8M: A Large-Scale Video Classification Benchmark. S. Abu-El-Haija et al., arXiv, p. 1609.08675v1 (2016).