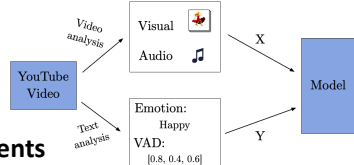


## Motivation

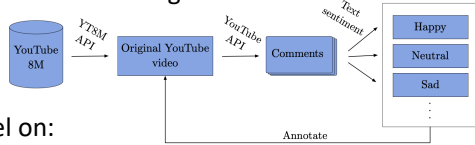
- Purpose: Find scenes which are *funny, scary, sad ...*
- Annotation expensive.  
No existing datasets!



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

## Approach

- Using videos from SNS (YouTube):
  - Crawl videos + their top-n comments
  - Analyze comments using NRC sentiment dictionaries

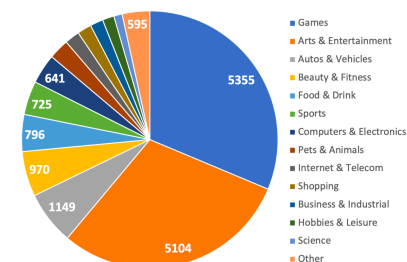


- Train model on:
  - X = [Visual features + Audio features]
  - Y = generated Emotion / VAD annotation

## Next steps

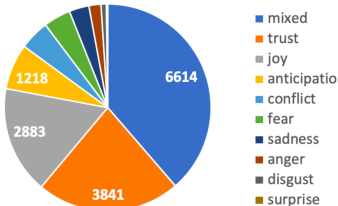
- Improve features
  - RGB / Audio currently simple average over all frames (Switch to RNN model)
  - Include audio sentiment, music mood, etc.
- Train separate models for different categories
  - **Can we find per-community sentiment models?**

## Dataset composition



Categories of videos

## Generated emotion distribution

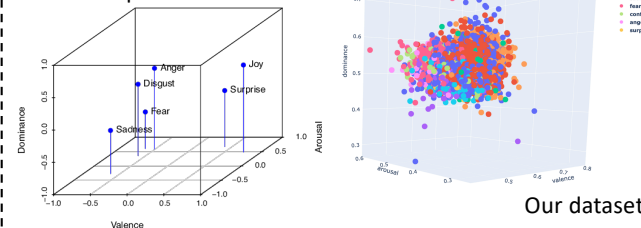


## Used datasets

- Sentiment dictionaries
  - [1] Crowdsourcing a Word-Emotion Association Lexicon, S. M. Mohammad and P. Turney, Computational Intelligence, 29 (3), 436-465, 2013
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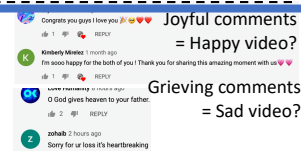
## Emotion

Relationship Emotion <-> VAD



## From comments to sentiment

- 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}



## Experiments

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

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	<b>2.84</b>	<b>0.55</b>	<b>1.95</b>	<b>0.55</b>	<b>1.93</b>	<b>0.38</b>

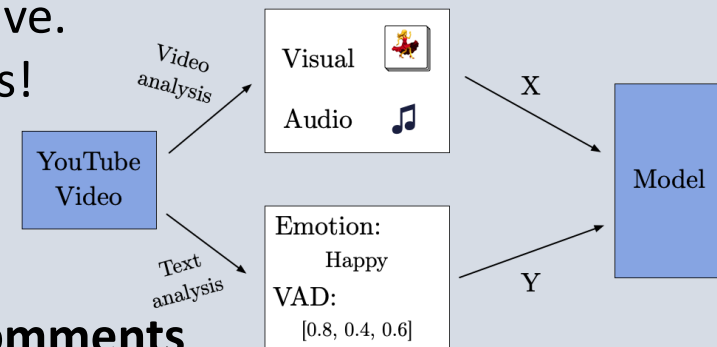
- Results
  - Works, but not enough data for some emotions
  - Dataset imbalanced

Table 2: Results for emotion estimation.

Features	Avg. Precision	Avg. Recall	Avg. F1 Score
Visual	0.30	0.39	0.28
Audio	<b>0.36</b>	<b>0.41</b>	<b>0.34</b>
Combined	0.33	0.41	0.31

## Motivation

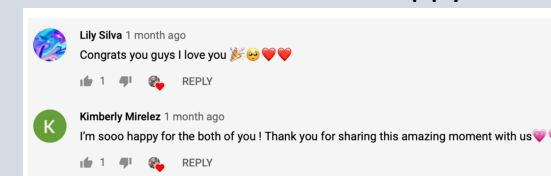
- Purpose: Find scenes which are *funny, scary, sad ...*
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- **Can we use user comments to cluster sentiment of videos?**

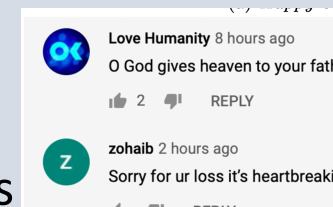
## From comments to sentiment

- The comments are direct reactions to comments
  - Sentiment analysis of comments helps understanding videos



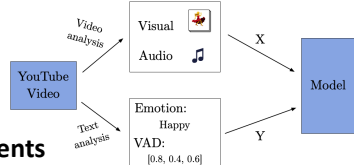
- Sentiment analysis to generate labels (majority decision)

Emotion = {sad, **happy**, ...} VAD = { 0.1, 0.5, 0.3}



### Motivation

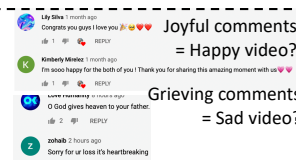
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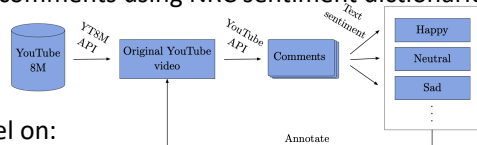
### From comments to sentiment

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

Table 2: Results for emotion estimation.

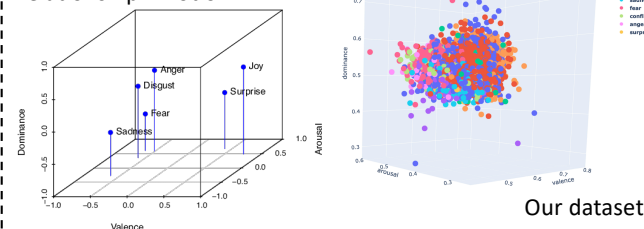
Features	Avg. Precision	Avg. Recall	Avg. F1 Score
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### Next steps

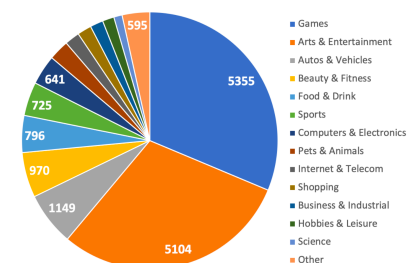
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### Emotion

Relationship Emotion <-> VAD

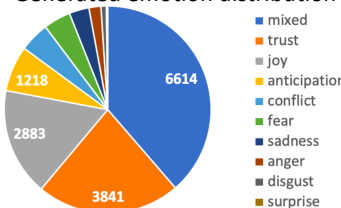


### Dataset composition



Categories of videos

### Generated emotion distribution

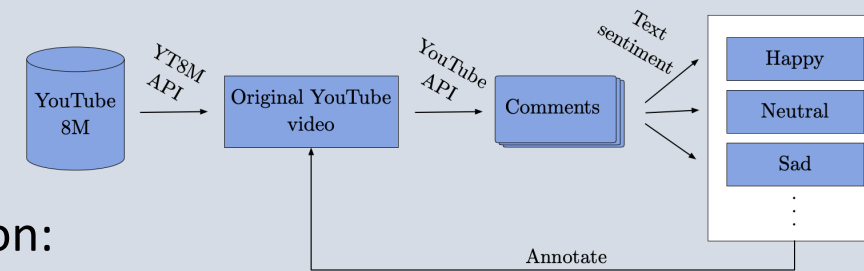


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- Sentiment dictionaries
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## Experiments

- Dataset: 17,112 videos with generated Emotion/VAD from their top-100 comments

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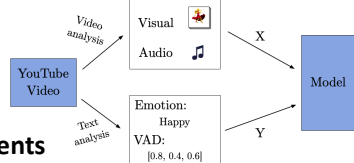
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### Motivation

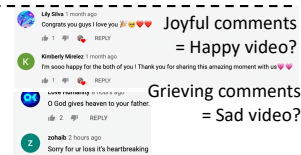
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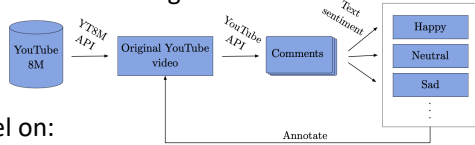
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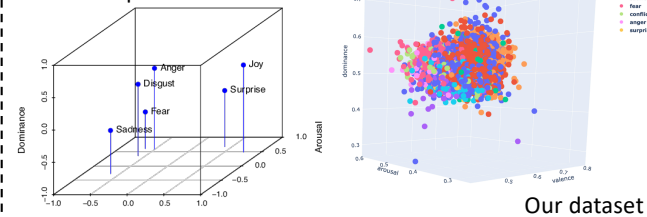
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### Next steps

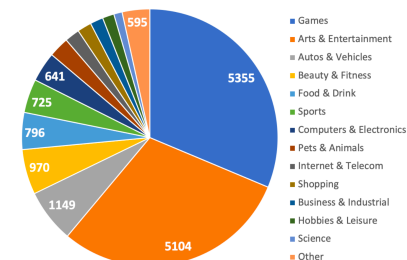
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### Emotion

Relationship Emotion <> VAD

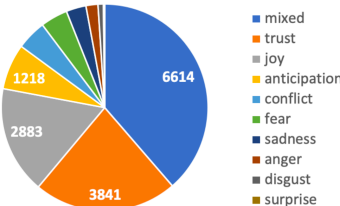


### Dataset composition



Categories of videos

### Generated emotion distribution



### Used datasets

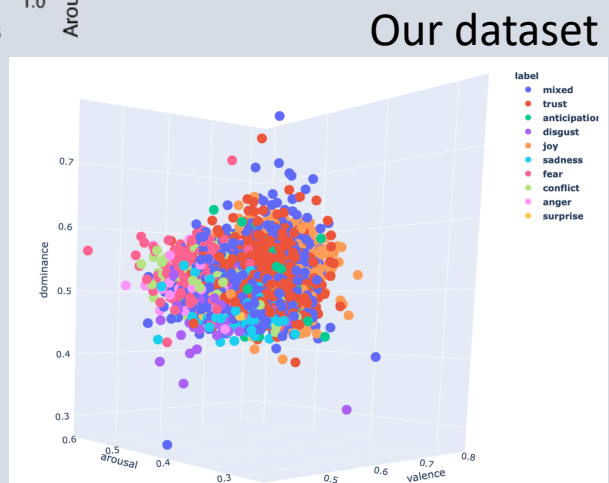
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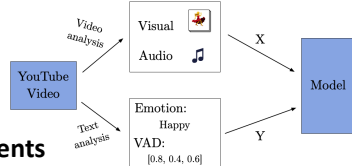
## Emotion

Relationship Emotion <> VAD



## Motivation

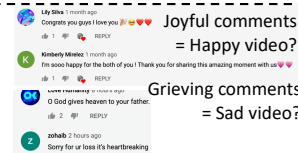
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No existing datasets!



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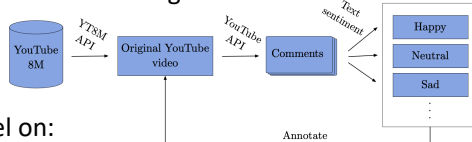
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Table 2: Results for emotion estimation.

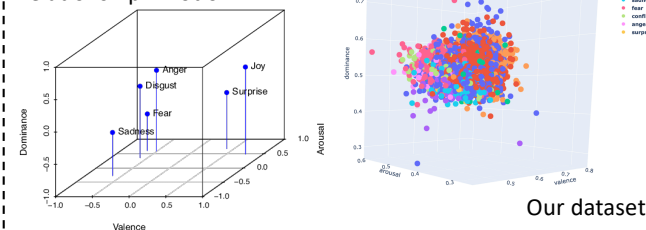
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## Next steps

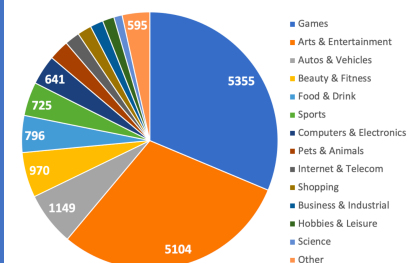
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  - **Can we find per-community sentiment models?**

## Emotion

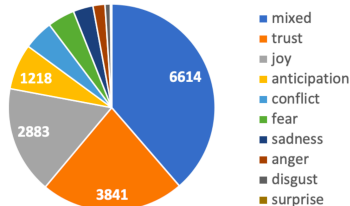
Relationship Emotion <-> VAD



## Dataset composition



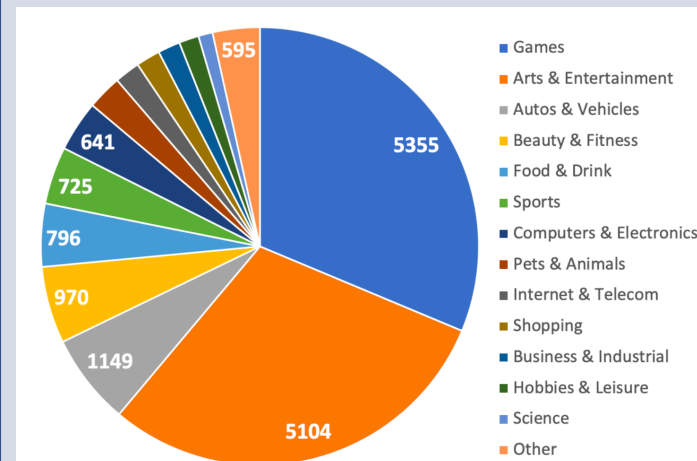
## Generated emotion distribution



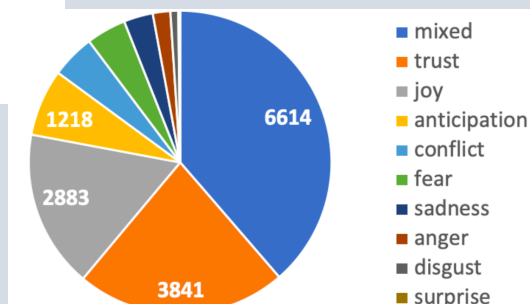
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## Categories of videos



## Generated emotion distribution



## Used datasets

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