



A ZOOM FILTER FOR APPLAUSE AND LAUGHTER

Meeting 02.02.22



What's the problem?

Motivation

- Little feedback when speaking at virtual conferences
 - Laughter and Applause

Idea

- Automatic laughter and applause detection in real-time
 - Using machine learning
- Ideally add this to an existing system as alternative to 'Mute'

=> No previous work for this particular use case.



Existing approaches

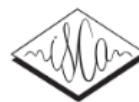
1. Multi-modal vs. audio-only
2. Pre-segmented vs. boundary detection
3. Post processing vs. real-time processing



Project from 2018: <https://www.ideo.com/blog/why-your-office-needs-a-laugh-detector>

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Robust Laughter Detection in Noisy Environments

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link: https://www.isca-speech.org/archive/interspeech_2021/gillick21_interspeech.html

Considerations

1. Latency
2. Computational cost
3. Threshold: 0.4:  0.6: 

Approach

- Use existing state-of-the-art model
- Evaluate it on a new dataset: ICSI corpus
 - suits our domain
- Adapt it for real-time usage

3 Results: Evaluation

- average meeting length: 56min
- average laughter length during meeting: 2:06 min

	new method		Laughter in [min:sec]		
threshold	precision	recall	predicted	actual laughter	noise
0.2	20.44%	37.40%	5:03 min	1:08 min	3:55 min
0.4	53.84%	20.68%	1:00 min	0:33 min	0:27 min
0.6	79.68%	8.92%	0:14 min	0:11 min	0:03 min
0.8	90.44%	3.22%	0:04 min	0:04 min	0:00 min
Gillick et al.	67.6%	84.7%	2:38 min	1:47 min	0:51 min

Retraining the model

- **Problem: Data-Loading**

- *70h of audio – only a few minutes per meeting will be used*

- **Original approach is way too slow**

- *Difference between Switchboard and ICSI dataset*

=> **Lhotse:** Python library for speech and audio data preparation

- *still in development*

Next steps

- By End of Week 4: Evaluation of first model trained on ICSI
- By End of Week 6: Evaluation on **MobileNet v3** model
- By End of Week 9: First draft
- By end of Week 11: Final version

Recap

- Existing approaches + considerations
- Evaluation on the ICSI dataset
- Retraining the model
- Next steps