Emotion Recognition Using Fusion of Audio and Video Features

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Outline

Why emotion recognition is important?

1. Interpersonal Relationships
2. Human Computer Interaction

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Applications

1. Call centers (Zoom, Hangout, Skype, etc.)
2. Business meetings
3. Tutor Agents

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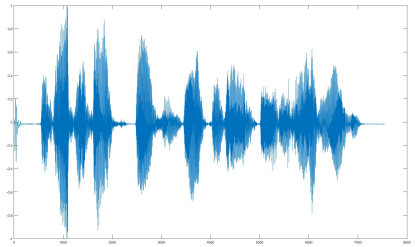
Emotion Expression Modalities

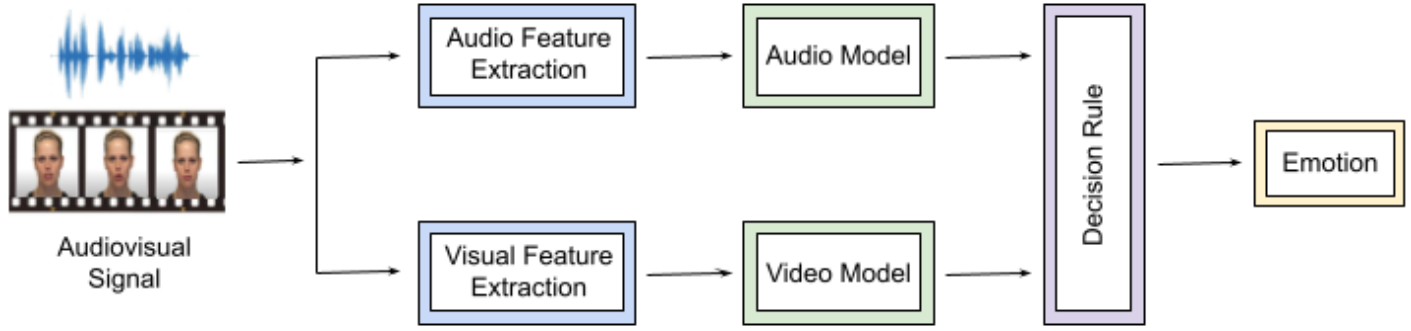
PURE
TEXT

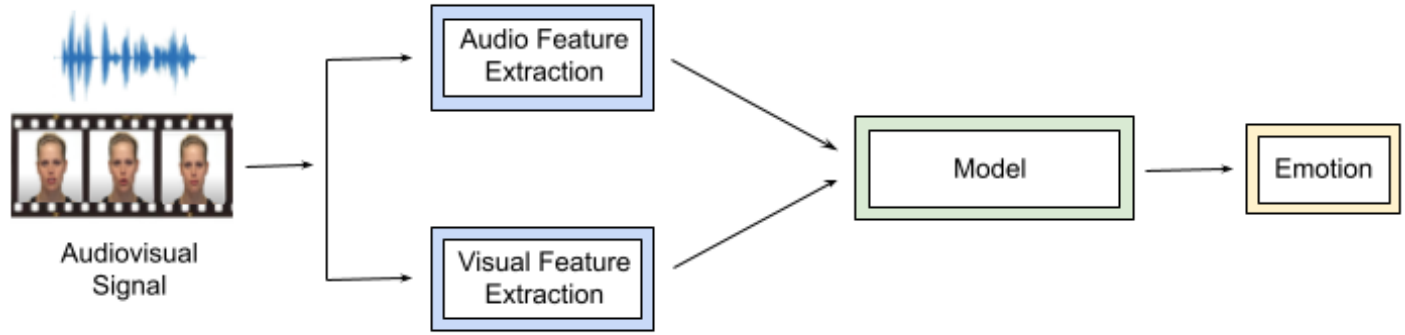


Datasets

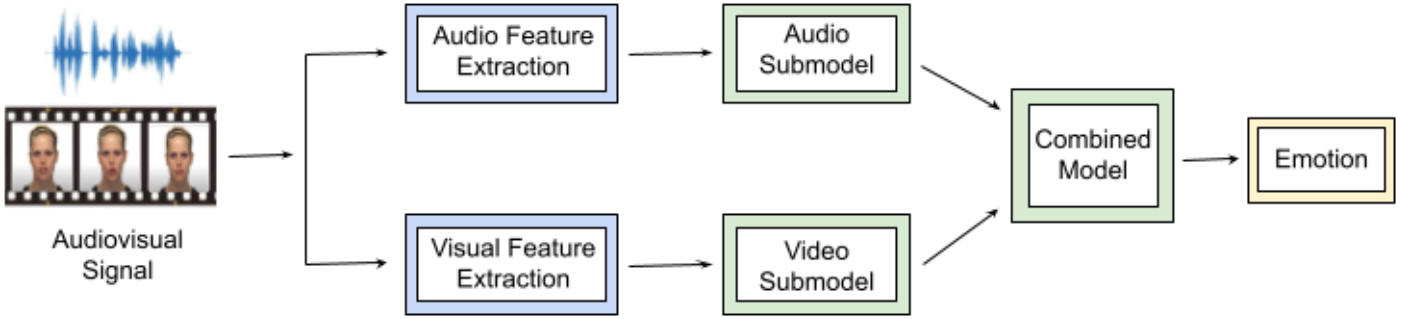
1. RAVDESS (Livingstone and Russo, 2018)
2. SAVEE (Philip and Haq, 2014)
3. IEMOCAP (Busso et al., 2008)
4. SEMANIE (Mckeown et al., 2010)
5. AFEW (Dhall et al., 2012)
6. eNTREFACE'05 (Martin et al., 2006)
7. ...

Methods


Audiovisual Signal
Audio Feature Extraction
Visual Feature Extraction
Audio Model
Video Model
Decision Rule
Emotion


Audiovisual Signal
Audio Feature Extraction
Visual Feature Extraction
Model
Emotion

Methods


Audiovisual
Signal
Audio Feature
Extraction
Visual Feature
Extraction
Audio
Submodel
Video
Submodel
Combined
Model
Emotion

Major contributions

1. Use hybrid method for modality fusion on the raw data (e.g., audio and pictures from video) to be able to use existing whole content
2. Train and test sets separation based on the speakers (this is important as models tend to overfit to speakers and so the generalization error will be high in this cases)
3. Use mixture of different datasets with augmentation of real world noise in order to provide robustness

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Emotions and Datasets

Eemotions

1. Happy
2. Angry
3. Sad
4. Neutral

Datasets

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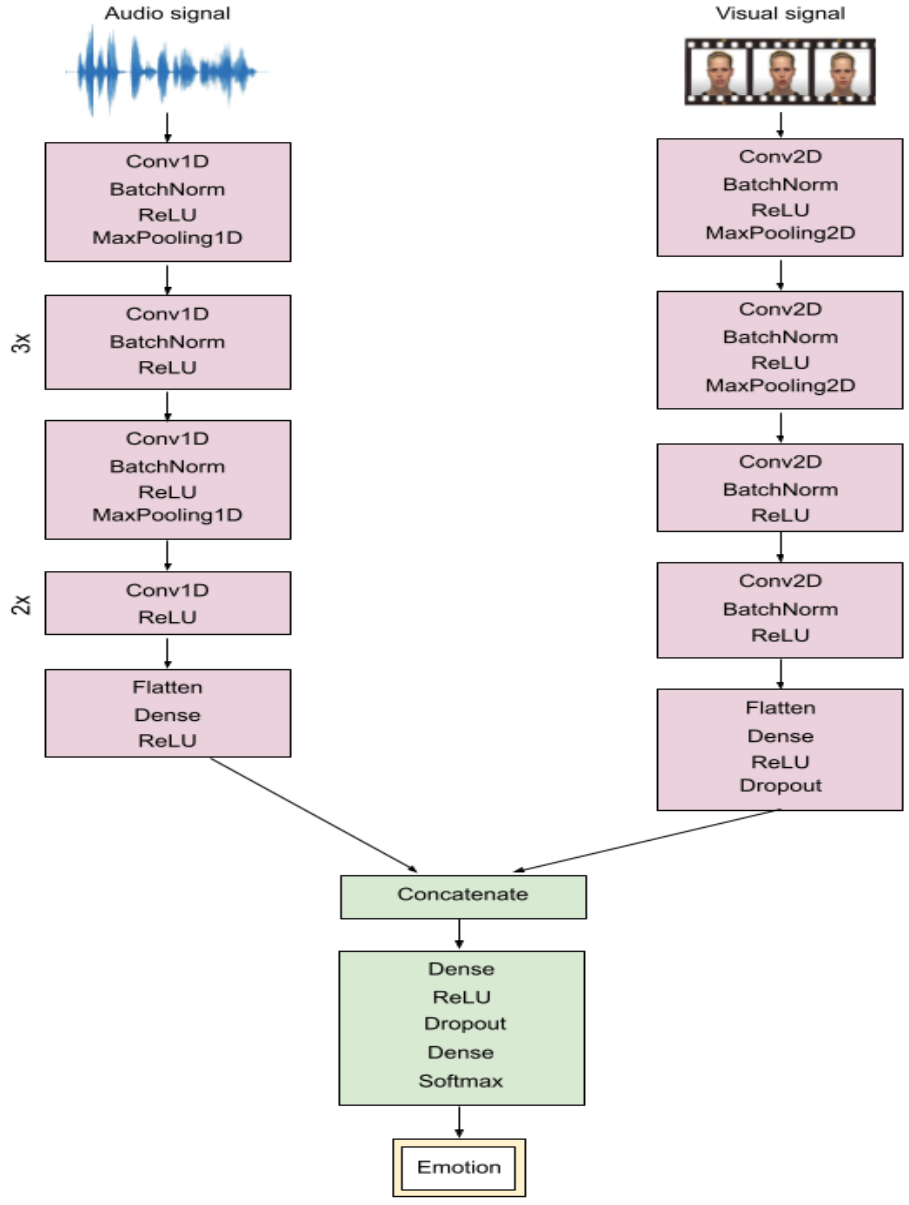
Proposed Architecture

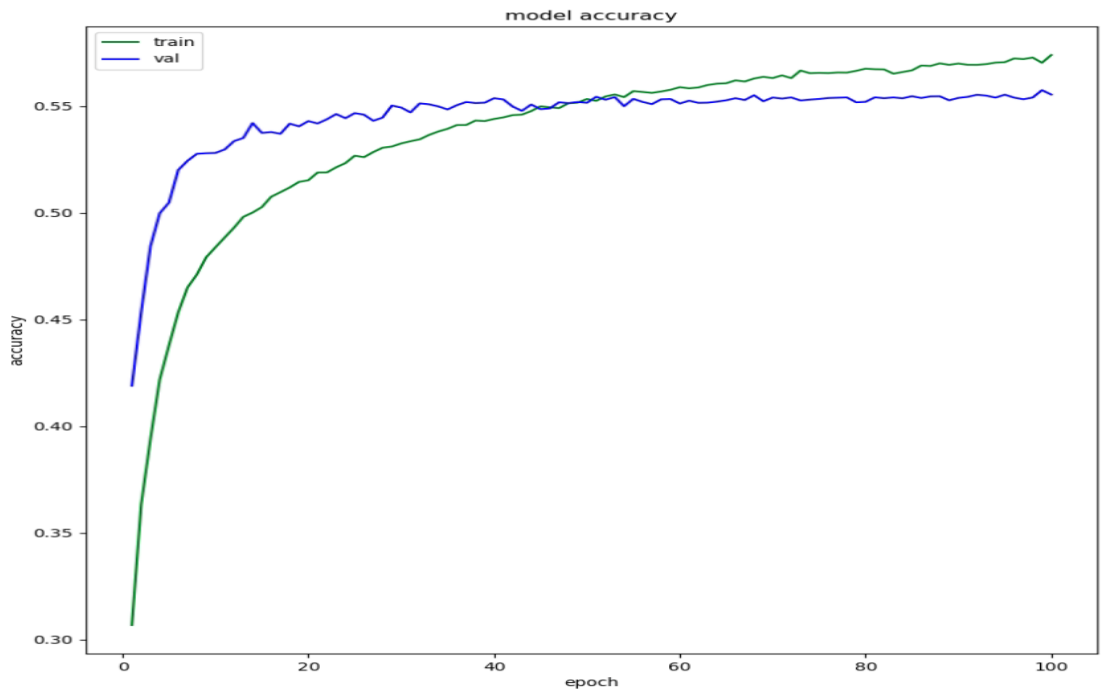


Results Random Split

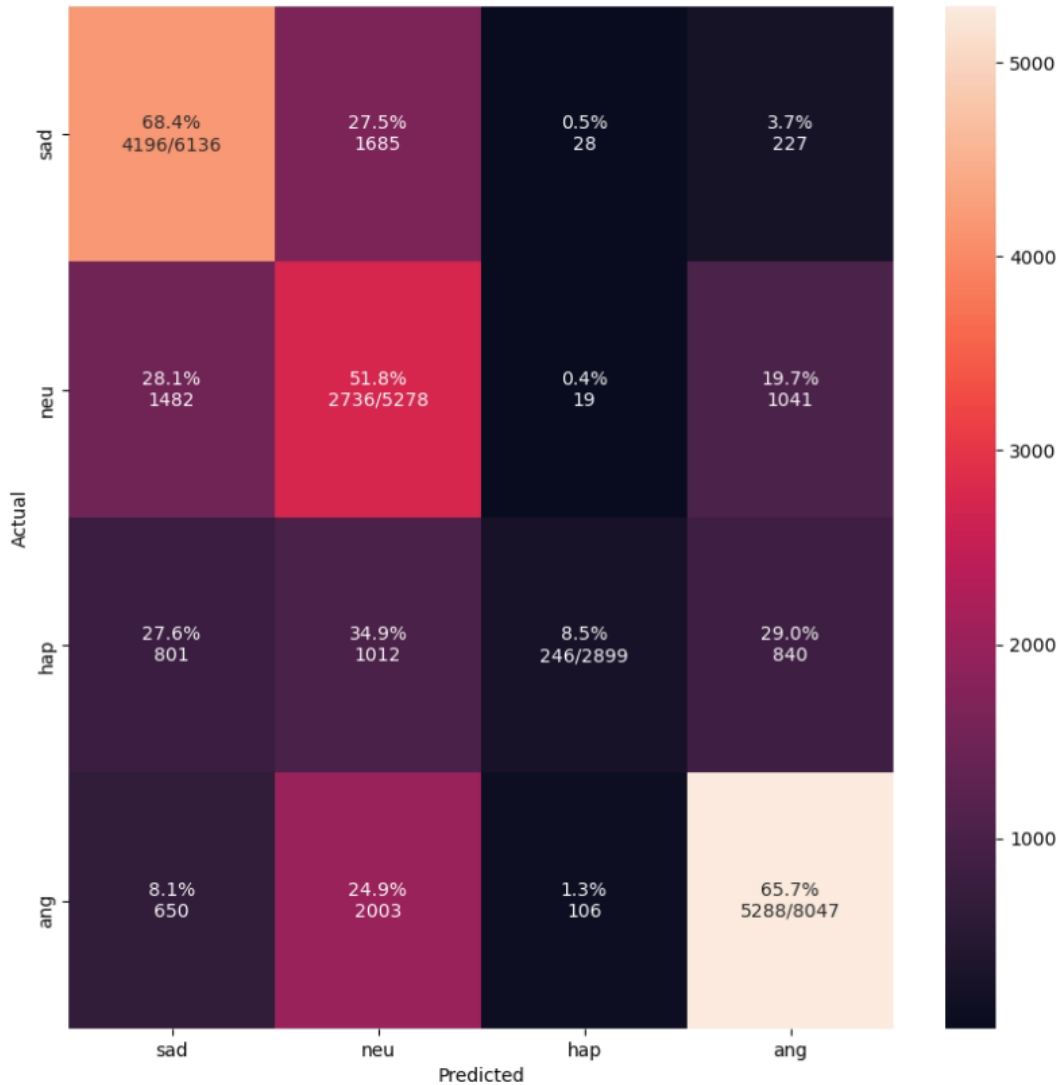
models	Accuracy random.s.	Accuracy speaker s.
Baseline	54	-
Lightgbm Audio	**87.7**	**57.6**

Results Speaker Split

models	Accuracy
Baseline	54
Audio model	54
Video model	**57.7**



Confusion Matrix



Demo

Please see the videos ...

Thank you!

References

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