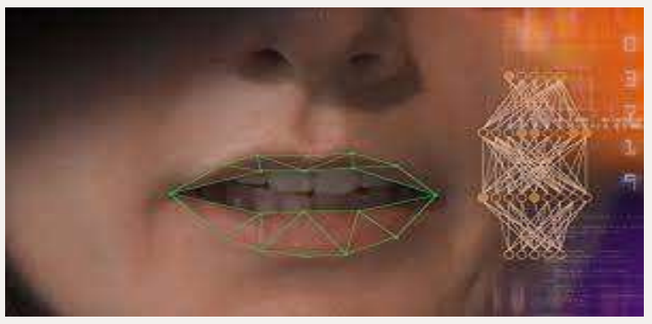
Hope Foundation's
International Institute of Information Technology, Hinjawadi, Pune
Dept. of Electronics and Telecommunication

LipNet : End-to-End Sentence level Lip Reading

INTRODUCTION

LipNet is an end-to-end sentence-level lip reading model that predicts sentences being spoken in a video by reading human lip movements.



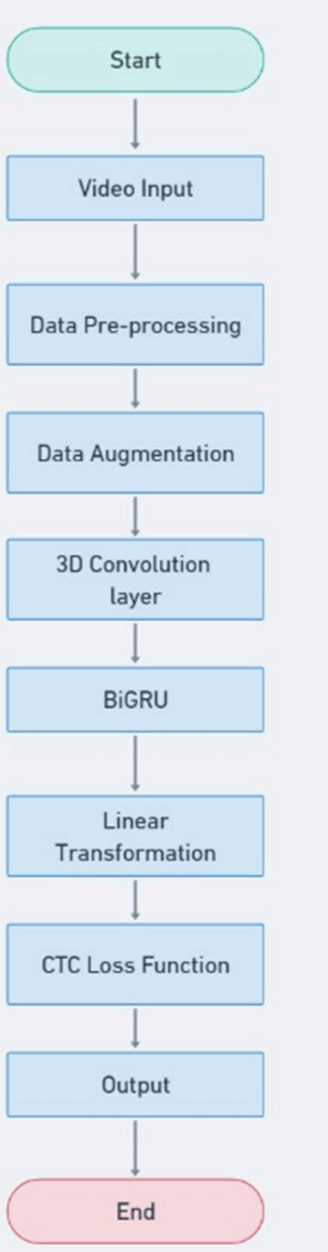
Need

I. Remove the communication barriers for deaf people.
II. Automated Video Transcription.
III. Not depending on sign language for communication.

Objective

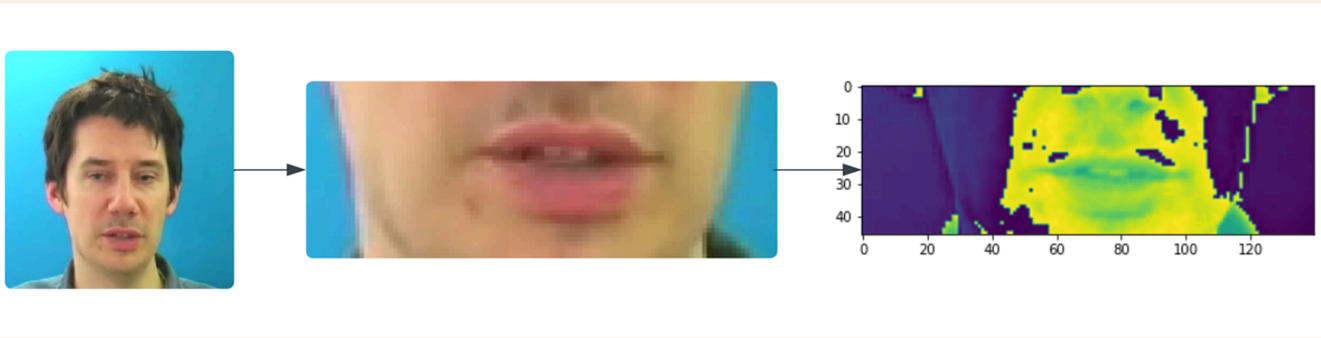
I. Develop a LipNet model to accurately transcribe spoken language from lip movements.
II. Create a user-friendly interface for real-time visual summarization and text analysis of lip movements.

Methodology

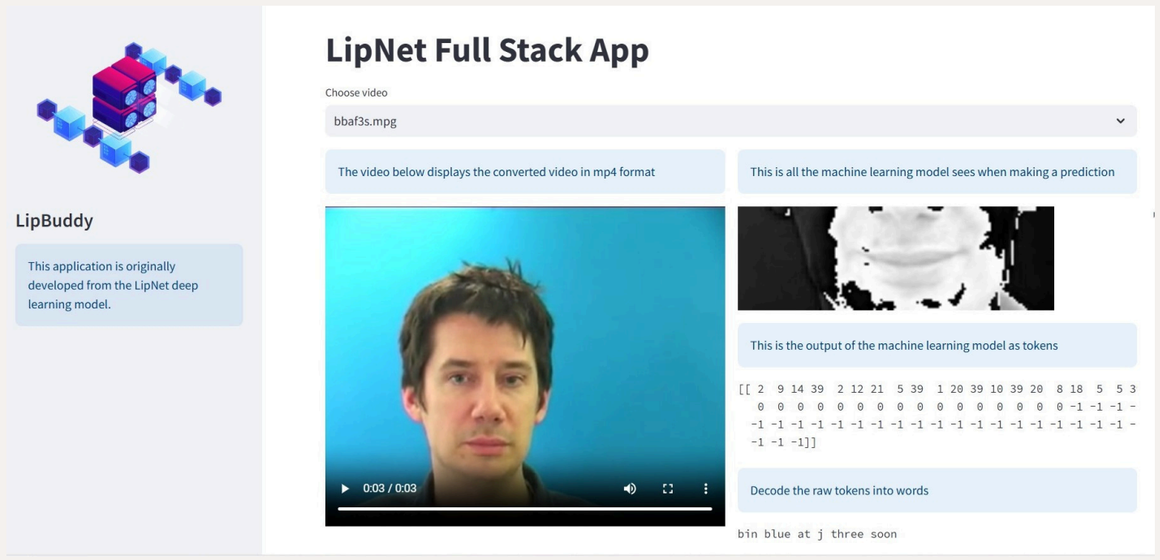


Results

Preprocessing



Model Result



Model Summary

Layer (type)	Output Shape	Param #
conv3d_24 (Conv3D)	(None, 75, 46, 140, 128)	3,584
activation_24 (Activation)	(None, 75, 46, 140, 128)	0
max_pooling3d_24 (MaxPooling3D)	(None, 75, 23, 70, 128)	0
conv3d_25 (Conv3D)	(None, 75, 23, 70, 256)	884,992
activation_25 (Activation)	(None, 75, 23, 70, 256)	0
max_pooling3d_25 (MaxPooling3D)	(None, 75, 11, 35, 256)	0
conv3d_26 (Conv3D)	(None, 75, 11, 35, 75)	518,475
activation_26 (Activation)	(None, 75, 11, 35, 75)	0
max_pooling3d_26 (MaxPooling3D)	(None, 75, 5, 17, 75)	0
time_distributed_11 (TimeDistributed)	(None, 75, 6375)	0
bidirectional_4 (Bidirectional)	(None, 75, 256)	6,660,096
dropout_4 (Dropout)	(None, 75, 256)	0
bidirectional_5 (Bidirectional)	(None, 75, 256)	394,240
dropout_5 (Dropout)	(None, 75, 256)	0
dense_3 (Dense)	(None, 75, 41)	10,537

Total params: 8,471,924 (32.32 MB)

Trainable params: 8,471,924 (32.32 MB)

Non-trainable params: 0 (0.00 B)

Conclusion

In conclusion, end-to-end sentence-level lip reading systems, with their potential to bridge communication gaps and enhance security, stand at the forefront of technology's transformative impact on accessibility and human interaction. Their versatile applications hold promise for a more inclusive and secure future.

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