

Speaker Identification by Spectrograms *

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The present study was aimed to find out the possibilities of speaker identification by verifying the spectrograms, based on acoustic features and to identify the acoustic features necessary for verifying the speaker, by comparing the spectrograms.

Words used in the study were extracted from five commonly used sentences, *i.e.*, 'I am fine', 'I am', 'What is it', 'I am sorry' and 'Thank you'.

Four adult male speakers uttered these sentences twice in the same situation. Spectrograms were obtained (Wide band and narrow band) using spectrograph VII 700 series and were randomly numbered.

A total of thirty interspeaker and four intraspeaker pairs and one pair for test-retest reliability were prepared.

These pairs were presented to three judges separately for verification. The judgements were found to be reliable.

The results indicated that the judges were able to identify the speakers correctly (95.5%).

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Acoustic Features

The following acoustic features were found to be helpful in verifying the speakers by comparing the spectrograms :

- Overall clarity
- Total duration of the word and duration of the individual phonemes
- Frequency range of burst
- Frequency range of noise
- Energy concentration
- Voice onset time.

Implications

- (1) It appears to be a promising method in identifying important acoustic features for speaker recognition.
- (2) By obtaining a weighting factor for each feature, which the examiner can use for verification, speaker verification by spectrogram can be made more objective.

Limitations

- (1) Rank ordering of the acoustic features was not done.
- (2) Only five words have been considered.
- (3) Only four subjects have been considered.