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Voiceprint Recognition using unsupervised statistical classifier

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Abstract:

Speech may be a basic sort of communication between human beings.Speechrecognitionisaprocesstoconvertspeechsoundto corresponding text. Speech recognition technology has been developed to a large extent within the previous couple of years. But still there exist many important research challenges

e.g. speaker and language variability, environmental noise and therefore the vocabulary size etc. the target of this paper is to present an entire perspective on speech recognition describing various processes and summarizing various methods utilized in a typical speech system. Index Terms: Speech recognition, Feature extraction, Modeling, Speech processing, Training & Testing.

I. INTRODUCTION:

Speech recognition, popularly also referred to as Automatic Speech Recognition (ASR) is that the process of converting a speech signal to a sequence of words using means of an algorithm implemented as a computer virus . Speech processing is one among the main fields of signal processing. The Speech recognition area aims to develop techniques for speech input to a machine [1]. the first computer systems were limited in scope and power. But the revolution in technology has evolved the sector of automatic speech recognition. Now a day's it is easy to store huge databases for speech recognition thanks to advancements in technology . Language may be a basic medium for communication, so it's better to expect human, computer interfaces in native languages.

II. SPEECH RECOGNITION SYSTEM:

The phone is captured employing a microphone to convert it into an electrical signal. the aim of the sound card inside the pc is to vary analog signals into digital signals. Sound card has capabilities to store and play this speech signal.There are following building blocks for general speech recognition system [7]. A. Signal preprocessing B. Feature extraction C. Language model D. Decoder E. SpeechRecognition A. Signal- processing Speech signals captured by the microphone, telephone etc. are analoginnaturesoitisrequiredtobedigitizedasperNyquist theorem. This theorem states that a signal is to be sampled quite twice the speed of highest frequency present in it. Generally sampling frequencies for speech signals are 8KHz and 20KHz. For telephonic speech signals it's recommended to possess the 8KHz rate while 16 KHz is usually used for normal microphones[8]. Speech signal Pre-processing Feature extraction Language modeling Decoder Recognizedspeech Fig. 1. Basic working of Speech Recognition System B. Feature extraction Feature extraction is employed to seek out a group of properties that are stable and acoustically correlated to every other. So it's a kind of parameterization of speech signal. Such parameters can form the observation vectors. The goal of the feature extractor is to spot relevant information for accurate classification. 78 Speech Recognition: an entire Perspective Pattern Classifier Feature Extractor Acoustic signal Mel Freq. Warping DFT Framing & Windowing Input Speech Signal Figure 2 shows the role of feature extraction in speech recognition. Recognized Text 79 Fig. 2. Role of feature extraction in speech recognition Linear predictive Cepstral coefficients (LPCC), Mel Frequency Cepstral Coefficients (MFCC), and PLP are a number of the commonly used feature extraction techniques [9]. the foremost widely used feature extraction techniques are discussed below:

a. *Linear Predictive Coding (LPC)*:

It's one among the simplest signal analysis techniques to estimate the essential parameters of speech. the essential concept behind this system is that present speech samples are often approximated by past samples by following a linear combination. a singular set of feature vectors can be obtained by minimizing the sum of squared differences between actual speech samples and predicted values [3]. Figure 3 shows the steps to extract the feature in LPC. Input speech Signal Frame blocking Windowing LPC Features Decision Tree Auto- Correlation Fig. 3. Steps to extract LPC Feature.

b. Mel Frequency Cepstral Coefficients(MFCC) :

The MFCC features are widely utilized in speech recognition, thanks to the logarithmic positioning of its frequency bands. It approximates the human auditory, more as compared to the opposite techniques. To extract the MFCC coefficients the signal at the input, undergo the hamming window to attenuate the discontinuities of the signal. LOG IDFT Mel Cepstrum MFCC Features Fig. 4. steps involved in MFCC feature extraction.

c. Perceptual Linear Prediction(PLP):

Perceptual Linearprediction (PLP) demonstrated an improvement over the LPC thanks to its three principal characteristics derived from the psycho-acoustic properties of human hearing just like the spectral resolution of the critical band, equal loudness curve, and intensity loudness power law[10]. Equal Loudness Power- law Spectral Analysis Window Critical Band Analysis Input IDFT Spectral Analysis P Post Processing All Pole Modelling PLP Features Fig. 5. diagram of PLP feature extraction approach C. Language modeling Languagemodelingisusedtofindthecorrectwordsequence by predicting nth words using (n-1) preceding words. Language modeling is of varied types. * Uniform model: where the occurrence of every word is equally probable. * Stochastic model: the probability of this word depends on the probability of word preceding it.

AREA OF APPLICATIONS:

within the previous couple of years, Speech recognition has gained wide approval. This wide acknowledgment is resulted thanks to the revolution in storage technology to handle big data like voice search on Google and other voice-enabled interaction with mobile devices. So speech recognition has wide applications in many fields like voice interface , domestic appliance control, voice dialing, voice-enabled search, data entry, learning applications for handicapped peoples.

CONCLUSION:

Speech may be a basic mode of communication between citizenry , so a feasible interface is required to attach human with many resources.

REFERENCES :

1. S. K. Gaikwad et.al, "A review on speech recognition technique", International Journal of Computer Applications, vol. 10, no. 3, November 2010. 2. K. Samudravijaya, "Speech and Speaker recognition tutorial??? TIFR Mumbai 4000005. 3. S. Naziya S. and R. R. Deshmukh, ??? Speech Recognition System- A Review???, IOSR Journal of Computer Engineering (IOSR-JCE), vol. 18, issue 4, (Jul.-Aug. 16), pp. 01-09. 4. W. M. Campbell, D. E. Sturim et.al, ???The MIT- LL/IBM speaker recognition system using high performance reduced complexity recognition??? MIT Lincoln Laboratory IBM 2006. 5. K. Brady, M. Brandstein et.al, Yu and L. Deng., "Automatic Speech Recognition???. Students: SAKTHI ANAND.M, SHARAN RAJU.K, SRIRAM.M., ECE department, Kalasalingam Institute of Technology, Krishnankovil. 79 79 79 2% Plagiarised but still there exist many important research challenges e.g. speaker and language variability, environmental noise and therefore the vocabulary size etc. the target of this paper ... [show full abstract] is to present an entire perspective on speech recognition describing various processes and summarizing...
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