

Picture Languages: Formal Models For Picture Recognition

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Punjabi Speech Recognition: A Survey

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Abstract – As Punjabi language is one of the most widely used languages in media and communication, its speech recognition is need of the hour. Hence, survey has been carried out for Punjabi speech recognition. In this, work has been carried out from boundary detection of isolated word recognition from Historical Perspective to that of present scenario. However, this has been limited to constraints and assumptions. This paper discusses the related work and future challenges.

Keywords – Automatic Speech Recognition, Punjabi language, Hidden Markov Model, Dynamic Time Wrapping, MFCC, LPC.

I. INTRODUCTION

Speech is the source of communication. It carries data in the form of signals. Automatic Speech Recognition [1] (ASR) is the automatic speech transformation system which translates the audio input into text form. Identifying the words being spoken, mapping text to speech, verifying or identifying the speaker etc. are some of the activities being covered in speech processing. Although great amount of work has been performed in English language for speech recognition, Punjabi, being one of the most widely used languages, deserve to seek attention of researchers in terms of speech processing. Speech Recognition has two phases namely: Preprocessing and Post-processing which are discussed further.

Accuracy, noise removal, information retrieval and varying bit rate are some of the most considerable part of speech recognition challenges.

1.1 TERMINOLOGY

The basic terminology is enlisted before proceeding with Punjabi Speech Recognition detailed study. **Phoneme** [8] is the basic unit of speech. During pronunciation, effect of two consecutive phonemes on each other is called **Co-articulation effect**. A **syllable** is the bigger unit which contains combination of phonemes. **Morphemes and Words** are more large units which contains combination of syllables. **Speech Corpus** is the database or collection of audio files.

Dictionary contains the words being spoken. There are two types of speeches namely **speaker dependent** and **speaker independent**. There are two types of audio files: **training data** based on which the models are trained and **testing data** based on which we test the performance of the model. Usually speech models are trained before performing testing.

1.2 PUNJABI – ASR

Punjabi language is popular Indo-Aryan tonal Language. It has syllabic-centered nature. It is mostly spoken in Punjab and other republic parts of India and Pakistan. It is written from left to write. This language has 32 different dialects. Being tonal, differentiation in emotional emphasis in

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