

PROPOSAL DETAILS

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Technical Details :

Scheme :	Start-up Research Grant		
Research Area :	Computer Engineering (Engineering Sciences)		
Duration :	24 Months	Contact No :	+917576917879
Date of Birth :	07-Jul-1982		
Nationality :	INDIAN	Total Cost (INR) :	25,08,445

Project Summary :

Automatic phoneme segmentation is an interesting problem where a system identifies the boundary points between different phonetic units. This problem is crucial in automatic speech recognition and annotation of speech corpus. The proposed project intends to develop a system for the automatic annotation of sentences. The development of such a system is important in making and evaluating speech recognition systems of various languages. The proposed project concentrates on the regional Indian language Telugu which is spoken widely in different states of India and other countries also. Even though it is rich in its vocabulary and grammar, the research in this language is incomplete due to its low availability of data. The influencing factor is the gap that exists between the available resources and current successful methods. The successful frameworks for ASR to address the problem are Hidden Markov Models (HMMs) and Deep Learning (DL). Both the techniques require a huge amount of data to build the annotation systems and the work is done is also questionable. Therefore, we intend to develop a system for annotating the sentences using an emerging area called Graph Signal Processing (GSP). The method uses graph theory and the foundations of signal processing techniques to understand the properties of speech signals. This will become advantageous since it has the capabilities to include both techniques. We worked on developing GSP methods to analyze speech signals by proposing a novel representation and framework.

Objectives :

â€¢ Exploring the new insights of GSP and using its strengths to build novel systems
â€¢ Developing a real-time segmentation tool that identifies boundaries between phonetic units in a sentence
â€¢ Sentence data understanding using structural methods to find phoneme boundaries
â€¢ Applying speech processing techniques to solve the problems related to native Indian languages

Keywords :

Phoneme Segmentation, Speech Processing, Hidden Markov Models, Sentence Modeling, Graph Signal Processing, Speech Annotation

Expected Output and Outcome of the proposal :

A real-time annotation system for speech data can be available to detect boundaries in Telugu sentence data. The system can be useful further to help in evaluating the algorithms for this problem. The result of the research can be useful for developing speech recognition systems. This will show impact in the field of research as no automated systems were not built so far. It will be helpful to the researchers to understand new insights in the area of Graph Signal Processing (GSP).
