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Participants: Nurbou Chuphal, Sarthe S, Aludien Arif, 111921065 111901065, 2519 194 5832, Aashra Saju

Viewing Sarthe S's screen

Purpose of Research Paper

- Establishes our Technical Intelligence
- Authority of our scholarly skills
- Communication of our intellectual work to peer community

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Computers and Electrical Engineering
 Journal homepage: www.elsevier.com/locate/compeleceng

Real time wearable speech recognition system for deaf persons[†]

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ARTICLE INFO **ABSTRACT**

Keywords: Speech processing; Speech recognition; Deaf; Quality of life

Numerous people around the world experience varying degrees of hearing difficulties. A sense of need is critical for quality of life for people with hearing difficulties, including deaf people. Recently, devices have introduced to assist the video recognition application using for deaf live and real time. They can assist deaf people perform their daily activities more easily without requiring assistance from others. In this study, we designed and developed a wearable, internet-based system that will enable deaf people to distinguish important contents, thereby improving their quality of life. The system consists of a microphone and a camera sensor and is connected to the main block, it is ready to be used with the device in which speech was detected using the Frequency-Organized Coefficients (FOCC), processing, and Dynamic Time Warping (DTW). This work evaluated in three different signal-to-noise environments in real time with a typical computer setup. The results had 90% accuracy, 90% specificity and 90% sensitivity.

1. Introduction

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Abhishek Anil Aashna Sajju

Participants (191)

Sanitha S

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Aashna Sajju

Abul Koshy Mathew

Abhinav Shibu

Abhirami Sinesh

Abraham Jerson

Abushek Anil

Adam Basil Anil

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The screenshot shows a document titled "Literature Review" with a section "2. Related work" circled in red. The document text includes:

daily lives. Additionally, various auxiliary communication applications have been developed to reduce the problem faced by the hearing-impaired. These innovations can help deaf people to communicate more effectively with others [1,3].

The aim of this paper is organized as follows. Section 2 presents an overview of the existing related work. Section 3, provides information of the methodology used in the study. Section 4 presents the results of the implementation. Section 5 discusses the results, and Section 6 concludes the paper and provides directions for future work.

2. Related work

LITERATURE REVIEW

Abhishek Anil [1] focused on helping young children with sign language training. The software made an interpretation of sign language for deaf students while watching video on a large screen.

Shreyas et al. [2] developed a transcription application for users who have difficulty hearing which detects words in various environments and was meant to help users with different difficulty levels.

Speech-to-text recognition (STT) technology automatically writes text from a person's speech according to previous research. STT has gone a long way to help the deaf. Gilling et al. [3] highlighted the effects of STT technology on users' learning performance in their study. STT was used for courses with different difficulty levels.

Sheng et al. [4] proposed a Dynamic Time Warping (DTW) algorithm for the detection of period periodicity in their study. The algorithm of DTW is based on three regions being identified in the first stage, and periodic wave regions in the second stage. Ghosh et al. [5] developed a system that detects environmental sounds and transcribed it into text that has two mobile applications. They proposed a specially constructed method for speech applications and used the DTW algorithm in the frequency domain.

Linear Predictive Cepstral Coefficients (LPCC) feature vectors are always compared to more studies with other feature vectors using different classifier algorithms. In the domain-based study [13], different algorithms were used: an artificial neural network (ANN) and the Frequency Cepstral Coefficients (FCC) were compared. Also, results, both LPCC and MFCC, have been demonstrated to have advantages and disadvantages. When LPCC has an accuracy of 94.20% in clear speech, MFCC has an accuracy of 89.16%. Yet, in noisy environments, MFCC feature vectors provide greater recognition accuracy. In [14], MFCC and spectral band feature methods were compared. It was observed that spectrum-based feature methods gave better results than the studies with MFCC vectors. Unlike LPCC, MFCC gives better accuracy results in literature. According to the Bangla language-based study using 20 speakers, 98% accuracy was achieved in a noise-free environment and 90% accuracy was achieved in a noisy environment [15].

Wahyan [16] used the MFCC-based method and Artificial Neural Network (ANN) classification method to verify 20 words, the Arabic alphabet. He designed a three-layer system with an average of 92.42% recognition accuracy with 92.98%, 93.26%, and

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Abhishek Anil Aashna Sajju

Abul Koshy Mathew

Abhinav Shibu

Participants (191)

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The screenshot shows a diagram titled "Speech recognition pipeline" with the following steps:

- Speech Pre-processing
- Feature Extraction
- Classification

Below the diagram is a figure caption: "Fig. 6. Speech recognition pipeline." To the right of the diagram is a flowchart showing the process from "Input" to "Preprocessing (STT)", "Feature Extraction", "Classified Words", "Neural Classification using ANN", and "Optimal Feature Selection using OCS".

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11:00:05 11:00:05

11:00:05 11:00:05

Abdul Aziz

Arsha Saju

Abd Eshy Marwan

Abhinav Datta

Layout

Viewing Saritha's screen

Algorithm 1: Proposed Algorithm

Input: A set of predefined building blocks, the population size, the maximal generation number, the image dataset for classification.

Output: The discovered best architecture of CNN.

- 1 $P_0 \leftarrow$ Initialize a population with the given population size using the proposed variable-length encoding strategy;
- 2 $t \leftarrow 0$;
- 3 **while** $t <$ the maximal generation number **do**
- 4 Evaluate the fitness of each individual in P_t using the proposed acceleration components;
- 5 $Q_t \leftarrow$ Generate offspring from the selected parent individuals using the proposed mutation and the crossover operators;
- 6 $P_{t+1} \leftarrow$ Environmental selection from $P_t \cup Q_t$;
- 7 $t \leftarrow t + 1$;
- 8 **end**
- 9 **Return** the individual having the best fitness in P_t .

```

graph TD
    A[Initialize the population of genes] --> B[Calculate fitness]
    B --> C[Generate offspring of individual population]
    C --> D[Calculate fitness]
    D --> E[Gene selection]
    E --> F[Calculate the algorithm fitness]
    F --> G[Compare with previous]
    G --> H{New problem is feasible or not?}
    H -- No --> I[Stop]
    H -- Yes --> J[Update position and velocity]
    J --> K{Is max iteration}
    K -- No --> E
    K -- Yes --> L[Return best solution]
  
```

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Arsha Saju

11:00:05 11:00:05

Abdul Aziz

Abd Eshy Marwan

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woes Thomas Loison

PARVATHY A S

Prinu Antony

Rachana D Prabha

Mute all Unmute all

Chat

Yes Ma'am from Abd Eshy Marwan to everyone 2:38 PM

Yes mam from Rasheed Ahmed (priority) 3:07 PM

Hi

To: Everyone

Please enter your feedback regarding the session using the link given below

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