MICROPHONE SPEAKER ANALYSIS: AUDIO SEGMENTATION AND FREQUENCY INSIGHTS

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Abstract. *Audio segmentation represents a technical process used for separating a stream of audio recordings, which frequently contain multiple speakers, into uniform sections. This paper explores the implementation of voice-dialing and recognition algorithms to examine and analyze the technology's capability to accurately identify and differentiate speakers in intricate environments. It aims to enhance our understanding of the technology's functionality, including its ability to discern speakers' emotions and gender. Additionally, a hardware simulation is conducted using a two-way microphone and an Arduino board. It seeks to emphasize precision in speaker recognition and diarization, along with the accurate transcription of speeches, by achieving optimal parameters and enhancing existing market models. It also explores the applicability of this technology in various fields by creating applications that mainly use Speech Diarization and Speech Recognition.*

Keywords: Emotion Detection, Gender Detection, Voice Recognition Hardware System.

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1. Introduction

Speaker diarization is a highly relevant paradigm in the current technological era, focused on identifying, segmenting, and assigning speakers within a continuous speech stream during conversations or speech events. Through speaker diarization, speakers can be detected and identified during conversations, enabling voice frequency analysis to determine the **speaker's gender and emotions**, even in complex scenarios with overlapping speech. From **security** and monitoring to **education**, **health**, **voice assistance** and even **information management**, this concept proves to be essential and overwhelmingly useful [2].

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