

AI-Driven Real-Time Speech Summarization and EHR processing for Enhanced Healthcare System

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Abstract

Clinical documentation is a time-intensive process that contributes significantly to the workload of healthcare professionals and may hinder effective doctor–patient interaction. This paper presents an AI-driven framework for real-time summarization of doctor–patient conversations using Automatic Speech Recognition (ASR) and Large Language Models (LLMs). The proposed system extracts clinically relevant entities and generates structured summaries compatible with Electronic Health Record (EHR) systems. A domain-adapted language model is employed to enhance contextual understanding and improve the accuracy of medical entity recognition. Experimental results demonstrate that the system significantly improves documentation efficiency while preserving semantic integrity. The proposed approach highlights the potential of AI-assisted clinical documentation to enhance healthcare data quality and reduce administrative burden.

Index Terms

Artificial Intelligence, Automatic Speech Recognition (ASR), Clinical Documentation, Clinical Entity Extraction, Electronic Health Records (EHR), Large Language Models (LLMs), Real-Time Speech Summarization