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English digits speech recognition system based on Hidden Markov Models

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English Digits Speech Recognition System Based on Hidden Markov Models

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26.1 INTRODUCTION

The field of Automatic Speech Recognition (ASR) is about 60 years old. There have been many interesting advances and developments since the invention of the first speech recognizer at Bell Labs in the early 1950's. The development of ASR increased gradually until the invention of Hidden Markov Models (HMM) in early 1970's. Researchers' contribution were to make use of ASR technology to what can be seen nowadays of various advancements in fields like multi-modal, multi-lingual/cross-lingual ASR using statistical techniques such as HMM, SVM, neural network, etc [1].

Speech recognition or more commonly known as automatic speech recognition (ASR) was defined as the process of interpreting human speech in a computer [2]. However, ASR was defined more technically as the building of system for mapping acoustic signals to a string of words [3]. In general, all ASR systems aim to automatically extract the string of spoken words from input speech signals as illustrated in Figure 26.1.

The main objective of this paper is to design and implement an English digits speech recognition system based on Hidden Markov Model (HMM) using MATLAB, which is capable of recognizing and responding to digits speech inputs. This English digits speech recognizer would be applicable and useful for various digits-based applications, such as banking systems, phone dialing systems and various other systems. In this research, we utilized statistical modeling method based on the Hidden Markov Models to recognize English language digits.