Voice-based Online Dictionary

Project code: SM3-02

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**Project overview**

**Introduction**

Nowadays, while the traditional keyboard input system is still developing, the vocal input system takes a more and more important place. Vocal input prevents the complex Chinese character input and allows people to use both their hands and mouths to deal with all their tasks at the same time. Besides, the online dictionary is getting more and more popular, which will provide quick and up-to-date information to users.

Modern speech recognition algorithms and techniques will be integrated with one of the most popular Chinese online dictionaries to form a user-friendly software package in this project. Apart from the advantage stated above, the product can also help people to recognize and learn Chinese.

**Aims and Objectives**

The project aims to create a software package with a speech recognition system, which collect and recognize user vocal input then the recognized output will be directed to an online dictionary to retrieve information.

The core part of this project is a large vocabulary Cantonese speech recognizer (vocabulary size is 8000). Different algorithm and design specification were applied to improve the overall recognition accuracy. In this project, statistical pattern recognition approach was used as it did not require much linguistic knowledge but only a huge amount of speech data.
The Overall System Block Diagram

- Speech
- GUI recorder
- Wave to mfcc
- Trained Models
- Adaptation
- Adapted Models
- CUWORD
- Viterbi Decoder
- DTW Matcher 1
- DTW Matcher 2
- Communication Interface
- Web Server
- Perl Script
- Dictionary
- Sub-set of Dictionary
- Training
- Trained Models

Input
- Information
- http
- http

Output
- http
Performance and Deliverable
The following is the performance of the overall system

![Graph showing performance by word length]

The following shows the distribution of Chinese words in the database

<table>
<thead>
<tr>
<th>Database (word length)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number in the dictionary database</td>
<td>2002</td>
<td>3770</td>
<td>620</td>
<td>1601</td>
<td>22</td>
</tr>
</tbody>
</table>

GUI
Register & Login use
Users have to record 68 Chinese Characters pronunciation for model adaptation to increase the accuracy. Users’ “own” model will be stored for later login use

Quick Use
Allow any user access immediately

Word length selection
It reduces the confusion on recognition and provides higher accuracy.

Website Selection
The recognized output can be delivered to the Chinese dictionary website, Yahoo and HKUST library search engine for your preference.