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### **RESEARCH ARTICLE**

# Speech Segmentation and Classification Using Improved SVM and HMM Techniques

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**ABSTRACT-** *Voice classification is new area of interest for researchers in data mining. The system recognize voice show us that speech in words. In new android or IOS application mobiles this facility is available. The mobile operate by voice of any person. We need to speak in microphone speaker of mobile and it will operate same function which we want. Voice classification is part of data mining. Many techniques have been used till now for this purpose but some drawbacks exist in each technique. In this research work we will take existing technique HMM (Hidden Markov Model) and modify SVM (Support Vector Machine). SVM is already exist technique which work in two dimensional classification. But we modify it for working in multi-dimensional classification. Due to new feature of Multi-SVM it will perform better than existing. Data is taken of some voices in .wav format. We take some word's voice like apple, banana, kiwi, lime, orange, peach, and pineapple. These voices are input of work. Data trained and tested first of all then classify using multi-SVM. The results of classification are using multi-SVM is better than existing HMM technique.*

**KEYWORDS:** *data dredging, data fishing, data snooping, data mining.*

## 1. INTRODUCTION

Speech segmentation is the process of identifying the boundaries between words, syllables, or phonemes in spoken natural languages. The term applies both to the mental processes used by humans, and to artificial processes of natural language processing.

Speech segmentation is a subfield of general speech perception and cannot be adequately solved in isolation. As in most natural language processing problems, one must take into account context, grammar, and semantics, and even so the result is often a probabilistic division (statistically based on likelihood) rather than a categorical one. Though it seems that coarticulation - a phenomenon which may happen between adjacent words just as easily as within a single word - presents the main challenge in speech segmentation across languages, some other problems and strategies employed in solving those problems can be seen in the following sections.

## 2. Process

The Knowledge Discovery in Databases (KDD) process is commonly defined with the stages:

- (1) Selection
- (2) Pre-processing
- (3) Transformation
- (4) Data Mining
- (5) Interpretation/on-It exists, however, in many variations on this theme, such as the Cross Industry Standard Process for Data Mining (CRISP-DM) which defines six phases:

- (1) Business Understanding
- (2) Data Understanding

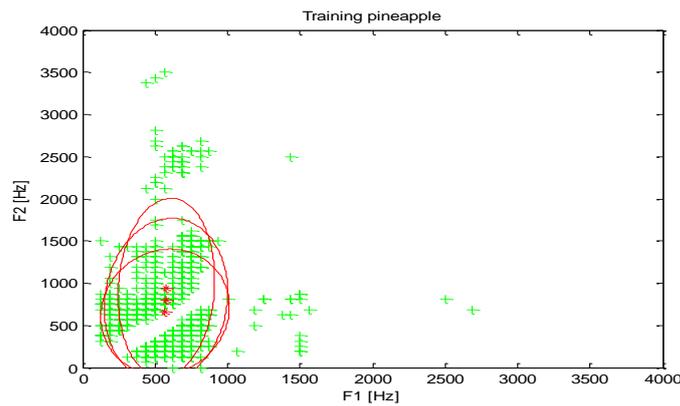
- (3) Data Preparation
- (4) Modelling
- (5) Evaluation
- (6) Deployment or a simplified process such as

- (1) pre-processing,
- (2) data mining, and
- (3) results validation.

Polls conducted in 2002, 2004, and 2007 show that the CRISP-DM methodology is the leading methodology used by data miners. The only other data mining standard named in these was SEMMA. However, 3-4 times as many people reported using CRISP-DM. Several teams of researchers have published reviews of data mining process models, and Azevedo and Santos conducted a comparison of CRISP-DM and SEMMA in 2008.<sup>[19]</sup>

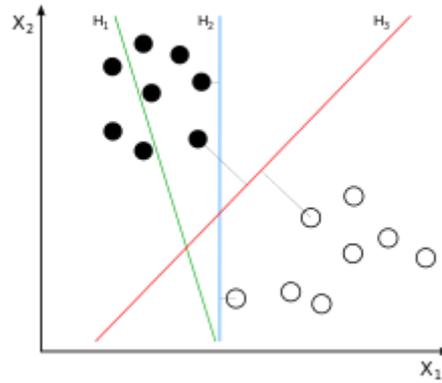
### 2.1. Pre-processing

Before data mining algorithms can be used, a target data set must be assembled. As data mining can only uncover patterns actually present in the data, the target data set must be large enough to contain these patterns while remaining concise enough to be mined within an acceptable time limit. A common source for data is a data mart or data warehouse. Pre-processing is essential to analyze the multivariate data sets before data mining. The target set is then cleaned. Data cleaning removes the observations containing noise and those with missing data.



### 2.3 Motivation and Results validation

Data mining can unintentionally be misused, and can then produce results which appear to be significant; but which do not actually predict future behavior and cannot be reproduced on a new sample of data and bear little use. Often this results from investigating too many hypotheses and not performing proper statistical hypothesis testing. A simple version of this problem in machine learning is known as overfitting, but the same problem can arise at different phases of the process and thus a train/test split - when applicable at all - may not be sufficient to prevent this from happening.



H<sub>1</sub> does not separate the classes. H<sub>2</sub> does, but only with a small margin. H<sub>3</sub> separates them with the maximum margin.

The final step of knowledge discovery from data is to verify that the patterns produced by the data mining algorithms occur in the wider data set. Not all patterns found by the data mining algorithms are necessarily valid applied to the test set of e-mails on which it had not been trained. The accuracy of the patterns can then be measured from how many e-mails they correctly classify. A number of statistical methods may be used to evaluate the algorithm, such as ROC curves.

If the learned patterns do not meet the desired standards, subsequently it is necessary to re-evaluate and change the pre-processing and data mining steps. If the learned patterns do meet the desired standards, then the final step is to interpret the learned patterns and turn them into knowledge.

### 3. IMPLEMENTATION

In my dissertation work we used MATLAB platform for implementation of my proposed work that provide a good programming environment. The dataset which we have taken also describe there on that dataset we implement our algorithm. We will describe about the software and hardware required for implementation. By using snapshots we describe what are the steps which we have follow to get result.

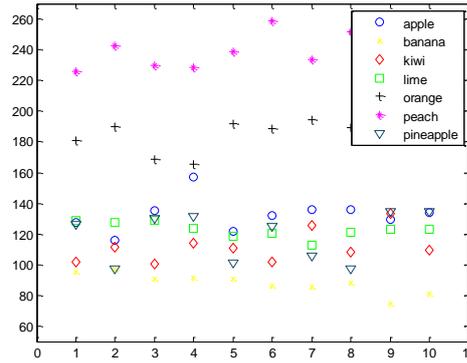
#### 3.1 TOOL USED

History of Mat lab:

- Developed by Cleve Moler in the late 1970s.
- Designed to give easy access to EISPACK and LINPACK.
- Rewritten in C in 1983; The Math works formed in 1984.
- Always recognized as one of the leading programs for linear algebra.
- Very popular among engineers and image analysts, among others.
- Version 5, released in the late 1990s, added many new features.

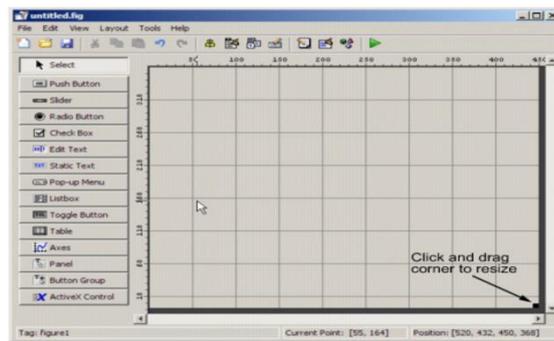
By default, matlab will open a console with a file browser and command history window along with a window to input commands.

MATLAB (MATrixLABoratory) is a numerical computing environment and fourth-generation programming language. Developed by MathWorks, MATLAB allows matrix manipulations, plotting of functions and data, implementation of algorithms, creation of user interfaces, and interfacing with programs written in other languages, including C, C++, and Fortran.



#### 4. Working of Graphical User Interface (GUI)

Most GUIs wait for their user to manipulate a control, and then respond to each action in turn. Each control, and the GUI itself, has one or more user-written routines (executable MATLABcode) known as callbacks, named for the fact that they —call backl to MATLAB to ask it to do things. The execution of each callback is triggered by a particular user action such as pressing a screen button, clicking a mouse button, selecting a menu item, typing a string or a numeric value, or passing the cursor over a component. The GUI then responds to these events. User, as the creator of the GUI, provides callbacks which define what the components do to handle events. This kind of programming is often referred to as event-driven programming. In the example, a button click is one such event. In event-driven programming, callback execution is a synchronous, that is, it is triggered by events external to the software. In the case of MATLABGUIs, most events are user interactions with the GUI, but the GUI can respond to other kinds of events as well, for example, the creation of a file or connecting a device to the computer. Although user can provide a callback with certain data and make it do anything user wants, user cannot control when callbacks will execute. That is, when user GUI is being used, user have no control over the sequence of events that trigger particular callbacks or what other callbacks might still be running at those times. This distinguishes event-driven programming from other types of control flow, for example, processing sequential data files.



#### 5. Conclusion and Future Scope

Successful completion of the voice classification of the given voice files for both algorithms. Along with this we have the completion of classification for the two algorithms of modified SVM&HMMclassification techniques. Comparison is performed by these algorithms on voice file. Only some samples of voice are taken and classify voice according words. In future the proposed algorithm can be applied on video files. The variety and quantity of data is constant in this work so in future we can vary these issues also

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