ABSTRACT

A wide range of voice-enabled technologies are evolved over the last two decades as a result of advancements in speech recognition technology. Most of the information/ resources which are very much useful for the farmers are available online. But the statistics indicate that most of the farmers do not have access to this source of information because of the huge adoption gap between farmers and technology. This digital division is a serious problem in the present era. The mode of information access is one of the reasons for it. Speech is the most natural mode of communication among human beings and it has the potential to be the most convenient mode of interface for accessing information. In other words, voice-enabled technologies have the potential to bridge the digital division gap. Normally to get some domain specific information users have to interact with interactive voice response system where some prerecorded voice samples are present to direct the user and user have to follow the path by pressing the duel tone multiple frequency. Due to low literacy, electricity problem, technical barrier, language issues these technologies are not useful for remote areas people. We try to investigate those issues and proposed some technical solution to overcome those barriers.In literatures we found that developing such kind of system and integrate it with telephone network is very difficult and not cost savvy. Our prototype model is efficient in terms of cost and research purpose. This thesis also explains the design, development and integration of a cost effective spoken dialogue system in Bodo language where native users can express themselves freely without having to learn a special way of speaking to get some domain specific information. The major contributions of this thesis are as follows:

a. A method is developed for the classification of voiced unvoiced and silence speech.

b. A detailed analysis is done using zero crossing rate, short term energy, pitch, energy and intensity for word boundary detection in Bodo language.

c. A detail analysis is made on different feature extraction techniques and classifier models to find best recognition model which gives the better accuracy with telephone network while building a spoken dialogue system.

d. Design and develop a Bluetooth based spoken dialogue system in agricultural domain which very much capable of act as a test bed for future research purpose.

e. Analysis on recognition performance based on rejection tag which is occurred due to signal error.

f. Propose a hypothesis for multiple decoders which are used to detect incorrect words and ambiguity of words to provide an estimation of the probability of correctness.

g. Propose an algorithm using Bodo corpus for speaker adaptation system to estimate the interpolation weights and adapted model parameters.

Keywords: Spoken Dialogue System, Voiced-Unvoiced-Silence Classification, Word Boundary Detection, Feature Extraction, Speaker Adaptation, IVR, Asterisk, Multiple Decoder, Bodo Language.