

## **Designing an Automatic Speech Recognition System to recognize frequently used sentences in Sinhala**

W.G.D.M. Samankula, M.Phil. Candidate, University of Kelaniya  
N.G.J. Dias<sup>11</sup>, Department of Statistics & Computer Science, University of Kelaniya

There are millions of people with visual impairments as well as motor impairments caused by old age, sickness or accidents. These people have to face a lot of challenges in their day to day lives. Even at home, if these people want to do a simple task such as control the radio, refrigerator, or fan, it becomes a difficult task because they have to use a white cane or wheel chair to move or get assistance from others.

The aim of this research is to develop a speaker independent continuous speech recognition system which is embedded with the capability of understanding human speech in Sinhala language rather than foreign languages because the majority of people in Sri Lanka speak Sinhalese. In order to achieve this goal, human speech signals have to be recognized and converted into effective commands to operate equipment.

The Hidden Markov Model Toolkit (HTK) based on Hidden Markov Model (HMM), a statistical approach, is used to develop the system. HTK is used for data preparation, training, testing and analysis phases of the recognition process. Twenty five sentences consisting of 2, 3 or 4 words in Sinhala which are frequently used in day to day activities at home were prepared. Recording process has been done with 10 native speakers (5 females and 5 males) in a quiet environment. Eight hundred speech samples have been collected for training from 4 males and 4 females by speaking each sentence 4 times.

The experimental results show 94.00% sentence level accuracy and a 97.85% word level accuracy using a mono-phone based acoustic model and, also a 99.00% sentence level accuracy and a 99.69% word level accuracy using a tri-phone based acoustic model.

**Keywords : Visually Impaired, Speaker Independent, Speech Recognition System**

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<sup>11</sup> Supervisor of candidate, W.G.D.M. Samankula