

Recognition of Voice Commands of Mentor Robot in Noisy Environment Using Hidden Markov Model

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Abstract : This paper presents an approach based on Hidden Markov Models (HMM: Hidden Markov Model) using HTK tools. The goal is to create a human-machine interface with a voice recognition system that allows the operator to teleoperate a mentor robot to execute specific tasks as rotate, raise, close, etc. This system should take into account different levels of environmental noise. This approach has been applied to isolated words representing the robot commands pronounced in two languages: French and Arabic. The obtained recognition rate is the same in both speeches, Arabic and French in the neutral words. However, there is a slight difference in favor of the Arabic speech when Gaussian white noise is added with a Signal to Noise Ratio (SNR) equals 30 dB, in this case; the Arabic speech recognition rate is 69%, and the French speech recognition rate is 80%. This can be explained by the ability of phonetic context of each speech when the noise is added.

Keywords : Arabic speech recognition, Hidden Markov Model (HMM), HTK, noise, TIMIT, voice command

Conference Title : ICTSD 2017 : International Conference on Text, Speech and Dialogue

Conference Location : Paris, France

Conference Dates : July 20-21, 2017