

A NOVEL APPROACH OF COMPUTING A DIAGNOLISATION MATRIX METHOD FOR SOLVING AN EVALUATION PROBLEM OF HOME AUTOMATION SPEECH RECOGNITION SYSTEM IN HIDDEN MARKOV MODEL

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Abstract

This paper proposes a computationally efficient method of solving an Evaluation problem of Hidden Markov Model (HMM) with a given discrete Home automated observation symbols, number of states and probability distribution matrices. The observation probability for a given HMM model is evaluated using an approach in which the probability evaluation is reduced to the problem of evaluating the product of matrices with different powers and formed out of state transition probabilities and observation probabilities. Finding powers of a matrix is done by using the computationally efficient diagonalization method thereby reducing the overall computational effort for evaluating the Evaluation problem of HMM. This proposed method presented in this paper is compared with direct, forward and backward methods. It is found that evaluating matrix power by diagonalisation method is more suitable than that of the other two methods. Speech recognition accuracy of 95.5% is obtained from testing the home automated speech signals on 16 states.

Keywords: Diagonalisation Matrix Method, Hidden Markov Model, Home Automation, Speech Recognition, Urn Ball Model.