Development of electronic nose for classification of aromatic herbs using Artificial Intelligent techniques

ABSTRACT

In normal practice, herbs identification is done mainly by botanists. However, it is difficult for a botanist to recognize herbs based on aroma measurement for species under the same family because they may have almost the same aromas. Moreover, several factors might influence the accuracy of the human olfactory system as a sensory panel such as physical and mental conditions. Meanwhile, non-human factors might involve various experimental exercises that are timeconsuming, less efficient and costly. Therefore, a small portable electronic nose that is easy to operate is proposed in this research. The herb leaves were blended as a mechanism in sample preparation was found as a preeminent procedure to overcome the drawback of the existing system. The emphasis on the ability of proposed electronic nose enhance with herbs recognition algorithm in this project was to distinctive odour pattern of the herbs leaves from three families group. Two classification methods, Artificial Neural Network (ANN) and Adaptive Neuro-Fuzzy Inference System (ANFIS) were used in order to investigate the performance of classification accuracy for this E-nose system. From the results, the developed E-Nose with both Artificial Intelligence (AI) techniques had performed well in distinguishing twelves herbs species. However, E-nose with ANFIS gives 94.8% percentage of accuracy higher than E-nose with ANN as 91.7% of accuracy. As a conclusion, the proposed E-nose system with AI technique application can classify the aromatic herbs species successfully.