

## **Development of neural network-based electronic nose for herbs recognition**

### **Abstract**

The ability to classify distinctive odor pattern for aromatic plants species provides significant impact in food industry especially for herbs. Each herbs species has a unique physicochemical and a distinctive odors. This project emphasizes on the techniques of artificial intelligence (AI) to distinguish distinctive odor pattern for herbs. Neural Network method has been exploited for the classification and optimization of various odor patterns. Based on AI techniques, Neural Network-based electronic nose system for herbs recognition has been developed. The system consist multi-sensor gas array which detects gas through an increase in electrical conductivity when reducing gases are absorbed on the sensor's surface. The output from individual sensors are collectively assembled and integrated to produce a distinct digital response pattern. A selected sensor array shows its relationship with the aroma of the herbs through the GC-MS test. By using five samples of herbs, the E-nose system has been tested with five different types of sensor. From the results, E-nose system with five sensors has the highest capability in classifying herbs sample. Accuracy in classifying the correct herbs increases with the number of sensors used. This investigation demonstrates that the neural network-based electronic nose technique promises a successful technique in the ability to classify distinctive odor pattern for aromatic herbs species.

**Keyword:** Electronic nose; Artificial neural network; Array of sensor; Classification; Recognition