

## 1. Introduction:

Odor nuisances generated by spoiled food items is considered to be an important factor influencing environmental pollution. These nuisances create bothersome to the humans in the surrounding. Moreover, eating such a spoiled food can be injurious to the human health. Nowadays, it is very common to use health care technologies in the ambient assisted living environment. Therefore, a strong desire emerges to develop an instrument capable of odor detection which could be installed on problematic sources in such an environment [1].

Numerous ways exist for the odor detection and the identification of the malicious odor substance. With the current state of art, the most common methodologies for the odor detection are scentometry and olfactometry [2]. The key challenges with current odor detection methodologies include the use of human's panelists for the assessments. Using human panel may not be an accurate solution due to a number of reasons such as variability in the sensitivity of individuals, personal biases, personal health and mood etc.

Research in the last few decades reveals that odor monitoring using sensors is more accurate and consistent way for odor detection [4]. The process of odor monitoring using sensors is known as machine olfaction. Advances in sensor technology and artificial intelligence techniques made it possible to develop devices capable of measuring and characterizing items on the basis of their odor. These devices are known as electronic noses [5].

An electronic nose is an instrument which is designed to mimic the functionality of the human nose. By definition, it consists of an array of chemo sensors and a processing unit armed with an appropriate pattern classification system [6]. A chemosensor is a device that is capable of converting a chemical quantity into an electrical signal. Various kinds of sensors are available, but nowadays four sensor technologies are most common in the development of electronic nose are metal oxide semiconductor (MOS); metal oxide semiconductor (MOSFET); conducting organic polymers (CP); and piezoelectric crystals [7]. Compared to other chemo sensor technologies mentioned earlier semiconductor technology has several advantages such as a simple principle of operation, low manufacturing cost and small size [8].

In this study, we developed an electronic nose having a MOS sensor array and a processing unit armed with a pattern recognition algorithm named support vector machine (SVM). The objective is to identify the malicious odor items on the basis of their smell prints. The rest of the paper is organized as follows. Section 2 briefly discusses the electronic nose based on MOS sensors. Section 3 includes description of the developed system using support vector machine (SVM). Section 4 presents, the experimental setup and the results achieved using SVM. Section 5 concludes the paper.