

# Abstract

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## **Discrimination of Some Atmospheric Gases Using an Integrated Sensor Array, Surface Response Modeling Algorithms, and Analysis of Variance (ANOVA)**

Gas identification represents a big challenge for improving detection and pattern recognition of each gas by using inexpensive gas sensor. The detection of gases found in atmosphere such as: Carbon dioxide, Hydrogen and Methane depend on Taguchi gas sensors by varying the load resistance of each sensor, which can increase sensibility and accuracy of gas detection. This paper provides the measurement setup for gas detection by using variation in load resistance; calibration curves of each gas with different concentrations; different sensors. It also presents the combination of a gas sensor array together with surface response modeling algorithms to detect the concentration of gas; to describe the performance of each gas. To investigate, the performance prediction accuracy of each model type, the predicted results for each empirical algorithm are compared with the actual results. The full quadratic empirical model is considered to be the best with, the least error using different sensors