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Gas Sensor Array with Neural Network Architecture for Ethanol at Room Temperature

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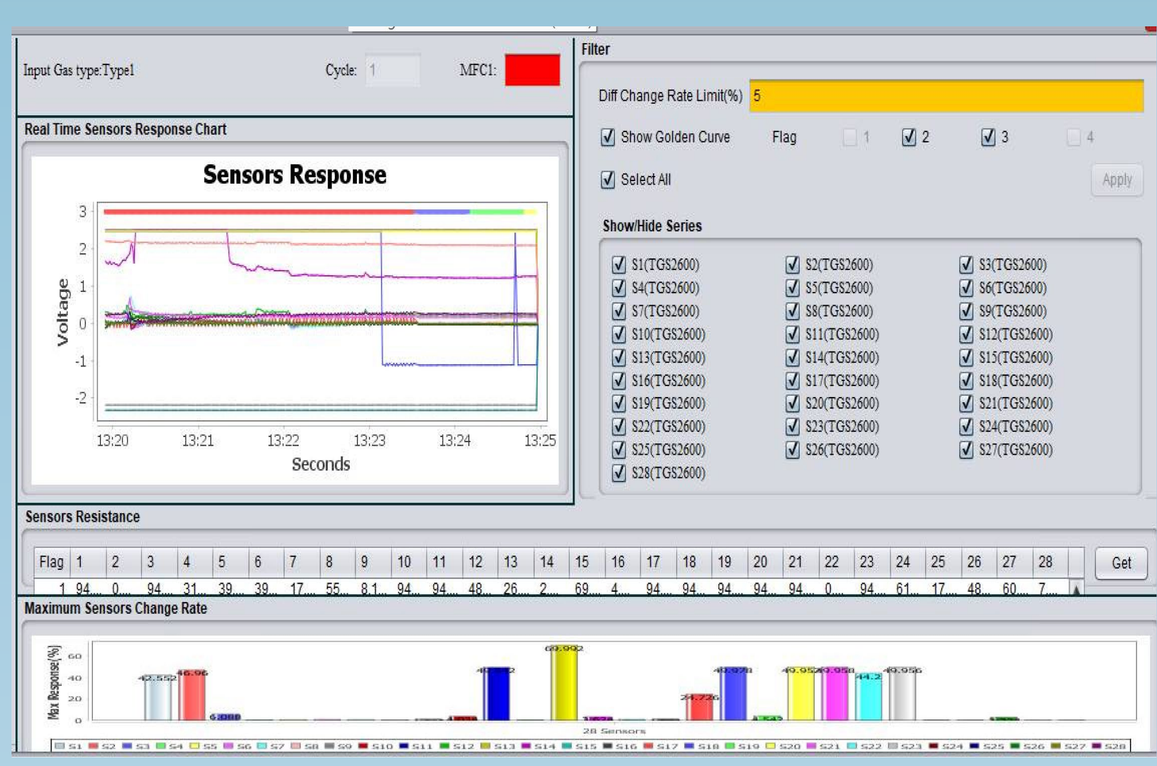
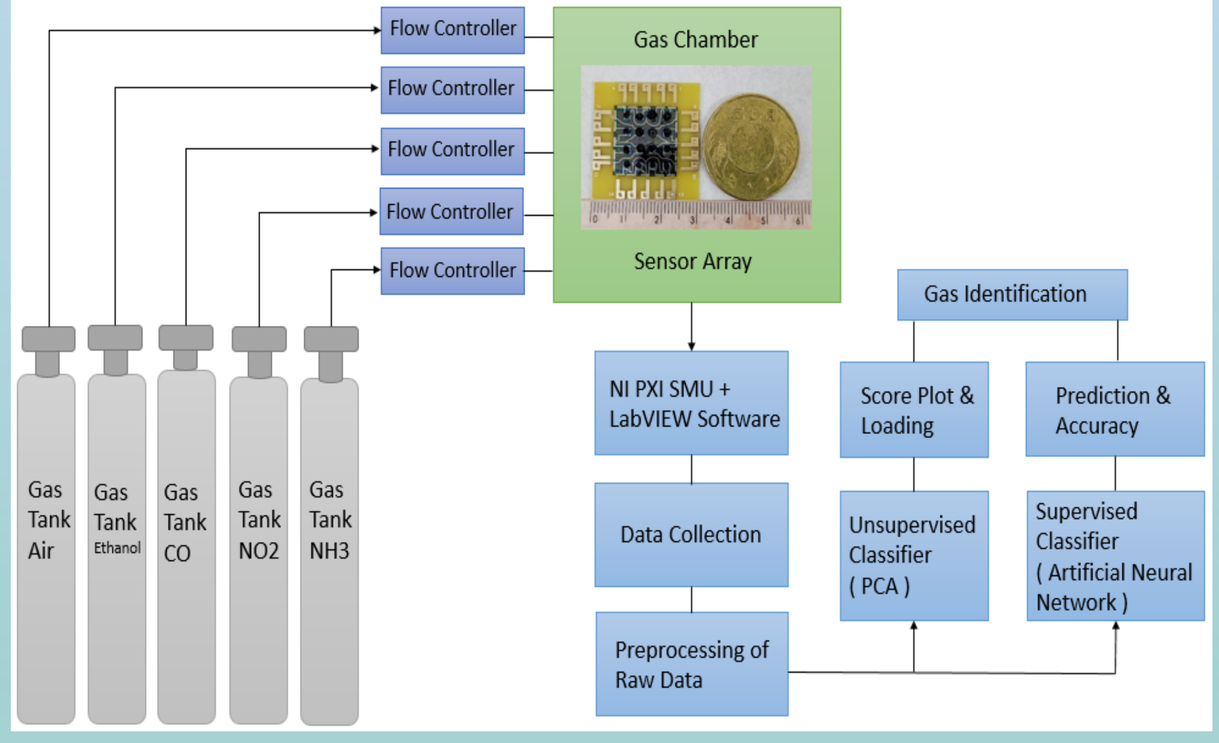
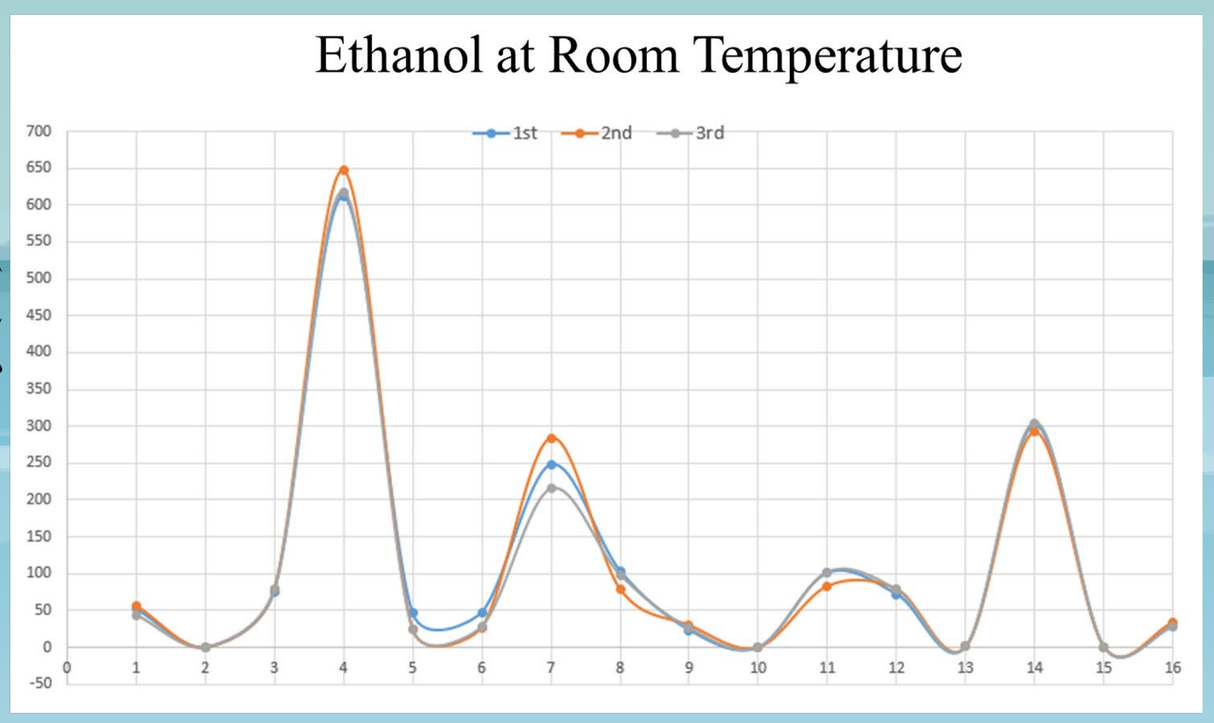
Abstract

We used polymers for sensing and successfully found that the thickness of the polymer film has a great influence on the adsorption effect. We tested ethanol and used 16 array sensors with a line width of 50μm and a sensing area diameter of 3mm. There are already measurement data available for comparison. The sensitivity of the device caused by the process error of the deposited film thickness is also corrected or compensated to help improve the problem. Small, low-energy consumption heterogeneous gas sensing elements are discussed. change rate can be used to simulate the odor concentration of ethanol.







Conclusion

The classification accuracy and overall performance of all considered neural networks are evaluated and compared to find the best algorithm available for accurate gas identification. Artificial intelligence technology with polymers can also be used in other composite gas-based sensors, allowing the sensor to selectively identify gases in a variety of mixtures and predict. Future applications:

1. Effectively predict diseases through artificial intelligence methods.
2. Use gas detection methods to detect the concentration of harmful gases.
3. Detect the presence of drugs and explosives through gas analysis.