

# Humidity Compensation by Neural Network for Bad-Smell Sensing System Using Gas Detector Tube and Built-in Camera

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A cheap and rapid sensing system is required for detecting bad smells and volatile organic compounds (VOCs). Although detection using a gas detector tube is a simple gas detection method, its measurement process has not been automated. We studied an automated measurement system for gas detector tubes using a built-in camera. Although the measurement was automated using our system, another problem was revealed. Because digital cameras are sensitive to color changes, a slight change due to humidity, which is not a problem in manual inspections, cannot be ignored in our system. Thus, a humidity sensor was added to the system. However, simple humidity compensation methods such as linear regression did not work because the humidity affected the data in a complicated manner. Therefore, a neural network was used for humidity compensation. Both the discoloration area and humidity data were input to the neural network. As a result, accurate concentration estimation was successfully performed.

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