PENINGKATAN TARAF IDENTIFIKASI JENIS GAS DI UDARA TERBUKA MENGGUNAKAN TRANSFORMASI *FOURIER* DAN *PRINCIPAL COMPONENT ANALYSIS*

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***Abstract***

*Classification of gases in open field is of great interest in many applications such as fire detection, environmental monitoring, etc. They all require reliable classification techniques due to dynamical change of gas concentration. A gas sensor array combined with Neural Networks pattern recognition algorithm has been traditionally used to address these issues. This paper reports a robust method for gas classification in the ambient air. In this research, we employ Fast Fourier Transform (FFT) method for frequency spectrum analysis and Principal Component Analysis (PCA) method for data extraction as preprocessing methods for a Back Propagation Neural Networks. A sensor array consists of three different types of semiconductor gas sensors producing a unique pattern for each gas in time domain. Several gases were introduced to evaluate the classification performance. The experiment result showed that classification rate of the Neural Networks with FFT and PCA methods as preprocessing was higher than that of the system without preprocessing even if the gas concentration changed into various conditions.*

***Key words:*** *Sensor Array, Frequency Spectrum, Principal Component Analysis, Neural Networks.*