

## ***Abstract: Extended Spherical Self-Organizing Maps for Anomaly Conditions Detection***

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### **Abstract**

We presented a system with an intelligent learning algorithm that detects anomaly conditions. This system was designed using EESOM(Extended Spherical Self-Organizing Maps), normal data, and the learning model. SOM is a suitable algorithm that learns multidimensional data fast and has high rate of cluster accuracy. ESSOM reduces local minima errors by using the Bayesian inference. It also applies a spherical map that supplements the border effect. In this study, a proposed system can detect anomaly conditions learning various standards of sensor data differ from mathematical model using existing normal data. The system detects anomaly conditions by using protection potential sensors, gas leak sensors, water level sensors and protection current sensors that are installed in the gas pipeline. Sensors are based on gas pipeline safety standards. The system calculates the similarity difference between the input data and the BMU by determining the Euclidian distance of data on the learning map.

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