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Development of Cloud-based Electronic Nose for University Laboratories Air Monitoring

Abstract

Indoor air in area such as house, shopping complex, hospital, university, office and hotel should be monitor for human safety and wellbeing. These closed areas are prone to harmful air pollutants i.e. allergens, smoke, mold, particles, radon and hazardous gas. Laboratories in university are special room in which workers (student, technician, teaching/research assistants, researcher and lecturer) conduct their works and experiments. These activities and the environment will generate air pollutants which concentration depending on their parameters. Anyone in the environment that exposure to these pollutants may have safety and health issue. This paper propose a study of development of a cloud-based electronic nose system for university laboratories air monitoring. The system consists of five dsPIC33-based electronic nose (e-nose) as node which measure main indoor air pollutants along with two thermal comfort variables, i.e. temperature and relative humidity. The nodes are placed at five different laboratories for acquiring air pollutants data in real time. The data will be sent to a web server and the cloud-based system will process, analyse and display by a website in real time. The system will monitor the laboratories main air pollutants and thermal comfort by forecast the contaminants concentration and dispersion in the area. In case of air hazard safety (e.g., gas spills detection and pollution monitoring), the system will alert the security by activate an alarm and through e-mail. The website will display the Air Pollution Index (API) of the area in real-time. Results show that the system performance is good and can be used to monitor the air pollution in the university laboratories.