

Real-Time Air Pollution Monitoring System and Tracking Mobile App

S. Mathithepan^{1*} and M. Kukapalini²

¹*Postgraduate Institute of Science, University of Peradeniya,
Peradeniya 20400, Sri Lanka*

²*Lansing Community College, Lansing, Michigan 48912, USA
mathithepan@gmail.com

Air pollution is a major environmental health issue in urban areas of Sri Lanka due to industrialization, urbanization, growing population rate, and increasing vehicle usage. The people who live in urban areas, face various harmful allergies and diseases due to poor air quality; the quality goes down beyond a certain level. Air pollutants have a negative impact on human health, stroke and lung cancer, for example, and harm the earth's ecosystem. The existing systems for pollution testing and real time updates in Sri Lanka are not efficient and also they are only installed in certain places that can cover a small area. Further, because these systems are fixed in a permanent place, the air quality alerts do not easily reach all the people who live in the surrounding area. To overcome these issues, this study suggests a new system that monitors the current pollution status of a particular location and gives updates through a mobile application to create self-awareness for the people to protect themselves. The system uses different sensor nodes designed in a mobile wireless sensor network (WSN) based on a mesh topology, to monitor temperature, humidity, particulate matter (PM) 2.5, PM 10, ozone, carbon mono-oxide, nitrogen dioxide, and sulphur dioxide concentrations in the atmosphere. Then it transfers these parameters to the cloud server by using Global System for Mobile communication (GSM) module and General Packet Radio Service (GPRS) module, which is an architectural design used for mobile communication between a mobile phone and GSM system. GSM/GPRS modules work with any mobile network coverage. The Air Pollution Monitoring system mobile App (APMAP) calculates the air quality index (AQI) of the collected data and generates the warning alert when AQI has passed the permitted threshold. This portable mobile app APMAP has been designed using cross-platform mobile app development tools that can be used over different mobile platforms easily.

Keywords: Air quality index, Particular matter, Portable tracking mobile app, GSM/GPRS based real-time system. Mesh topology, Wireless sensor network