A Low-Cost Air Quality Monitoring Internet of Things Platform

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Abstract : In the present paper, a low cost, compact and modular Internet of Things (IoT) platform for air quality monitoring in urban areas is presented. This platform comprises of dedicated low cost, low power hardware and the associated embedded software that enable measurement of particles (PM2.5 and PM10), NO, CO, CO_2 and O_3 concentration in the air, along with relative temperature and humidity. This integrated platform acts as part of a greater air pollution data collecting wireless network that is able to monitor the air quality in various regions and neighborhoods of an urban area, by providing sensor measurements at a high rate that reaches up to one sample per second. It is therefore suitable for Big Data analysis applications such as air quality forecasts, weather forecasts and traffic prediction. The first real world test for the developed platform took place in Thessaloniki, Greece, where 16 devices were installed in various buildings in the city. In the near future, many more of these devices are going to be installed in the greater Thessaloniki area, giving a detailed air quality map of the city.

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