

IIT-MADRAS DESIGNS IOT-BASED MOBILE DEVICE TO MONITOR AIR QUALITY

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Researchers at the Indian Institute of Technology Madras have developed a low-cost mobile air pollution monitoring framework.

Traditionally, ambient air quality is monitored in monitoring stations which then report air quality index (AQI). But the hitch is that the monitoring occurs only for a small geographic area.

As the levels can vary at different times of the day and setting up locations in more places is impractical, the researchers have now developed a new IoT-based mobile technology which would make it possible to map an entire city at high resolution using the low-cost devices.

Raghunathan Rengaswamy, dean, global engagement of IIT-M, and faculty in the department of chemical engineering, led the research. He said one specific location showed particulate matter of 2.5 pollution peaked between 1 a.m. and 3 a.m. due to milk being transported from a major hub. Similar peaks were found in some neighbourhoods during start and end hours of school and in commercial zones during peak hours.

The researchers undertook two case studies. One assessed hyper local air quality assessments to evaluate the effects of vehicle traffic, urban topography and urban functions. The second study analysed PM 2.5 levels during Deepavali festival, when fire crackers are lit in many households.

The pilot area chosen was a 15 sq km area of western Chennai to capture subtle variations in PM 2.5 concentrations across location and time. The case study was done jointly with the Centre for Urbanisation Buildings and Environment at the institute.

Autorickshaw mounted sensors plied on Chennai roads two days before Deepavali in 2019 and two days after the festival in commercial areas; a wooded academic campus; an upmarket residential area; and an industrial area with small-scale workshops were all surveyed.

The results were compared with the data from CPCB stations and the study and its findings were published in the peer-reviewed journal *Building and Environment*.

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