News Release
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Sensors to detect health effects of smog in pollution blackspot

Tiny respiratory monitors attached to the chest, and monitors worn as belts, will gauge the health effects of air pollution in one of the world's most polluted cities.

Researchers from the UK and India - led by the University of Edinburgh - will examine links between long-term exposure to air pollution and health in Delhi over a four-year period.

Last month, air pollution levels in the city reached more than 16 times the safe limit, prompting the local government to declare an emergency situation.

The Delhi Air Pollution: Health and Effects (DAPHNE) project involves 760 pregnant women, who will wear the air pollution monitors attached as adhesive patches. Scientists will record the health of both the mothers and that of their children following birth.

The multidisciplinary team of computer scientists, doctors, and exposure scientists from nine institutions in the UK and India will also focus on 360 young people with asthma in order to examine the level of exercise they can tolerate in the presence of air pollution.

The battery-powered respiratory monitors, known as RESpecks, and the air pollution monitors, called AIRSpecks, utilise so-called 'Speckled Computing', a technology being pioneered by scientists at the University of Edinburgh.

'Specks' are tiny devices that can be placed on everyday objects, and people, in order to sense, compute and communicate data.

In the DAPHNE project, these sensors transmit each person's data wirelessly to their mobile phone, enabling the user to monitor their individual exposure to pollution.

The project will also provide for larger versions of the same types of monitors, with additional sensors to measure concentrations of nitrogen dioxide and ozone. These will be attached to lampposts in order to create a network of monitors to measure air pollution levels across Delhi.

The data from the solar-powered lamp post monitors will then be uploaded via a 3G/4G cellular network and shared with those taking part in the study. The information will enable users to find the cleanest, shortest route between places in the city based on up-to-date information, personalised to their condition.

The devices have been developed at the Centre for Speckled Computing in the School of Informatics at the University of Edinburgh.

Professor D K Arvind of the University of Edinburgh, who is leading the study, said: "The DAPHNE project brings together best-in-class researchers from India and the UK to address the pressing problem of the health effects of sustained exposure to high levels of air pollution.

"We believe this innovative research, funded by the UK research councils over the past 15 years, could eventually help millions of people in Delhi and countless other global cities."

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Additional notes

- The Delhi Air Pollution: Health and Effects (DAPHNE) project was awarded £1,165,209 by the UK's Medical Research Council and Natural Environment Research Council, and is funded in India by the Department of Biotechnology and the Ministry of Earth Sciences.

- Indian partners include Sri Ramachandra University, Chennai; All India Institute of Medical Science, Delhi; Delhi University College of Medical Sciences; Indian Institute of Technology, Delhi; Indian Institute of Technology, Kanpur and INCLEN.

- UK Partners include the University of Edinburgh (Centre for Speckled Computing, School of Informatics and Centre for Cardiovascular Science), Imperial College (National Chest and Heart Institute), and the Institute for Occupational Medicine.

- The Centre for Speckled Computing, School of Informatics, University of Edinburgh was initiated by research grants of £5.3 Million in 2003 from the UK Engineering and Physical Sciences Research Council and the Scottish Funding Council.

- More information on the DAPHNE project can be found at www.specknet.uk

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