The Urban Air system can predict air quality based on readily available data about the city. Photo: HKEJ

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How big data could help in monitoring HK air quality

It may come as a surprise to some that there are only 15 air quality monitoring stations (12 general and three roadside) in Hong Kong to cover the city's 1,100 square kilometers.

One reason is that a monitoring station costs roughly HK$10 million (US$1.29 million) a year to operate.

And that is why Aberdeen, Sheung Shui and other relatively low-density areas are ignored on the real-time map of the Air Quality Health Index provided by the government.

Since air pollution is highly location-dependent and it's not possible to install as many monitoring stations as needed, a research team at the University of Hong Kong is developing a smart system called Urban Air.

The team is led by Professor Victor Li On-kwok of the university's electrical and electronic engineering department.

With a predictive modeling approach, the system collects readily available city operational data on 18 factors – such as vehicular traffic, the urban environment, temperature, wind speed and humidity — to estimate air quality for a specific area.

It is expected to improve the estimation efficiency and accuracy of urban air quality monitoring, Li told EJ Insight on Tuesday.

The Urban Air system has been tested in Shenzhen (the test page is at http://shenzhendata.azurewebsites.net/map/szgeneral.html).

Hong Kong is next.

The research project is supported in part by a grant from Microsoft Research Asia (MRA), which has been promoting research into and the application of big data in solving real-world problems.

In Hong Kong, MRA has been cooperating with HKU and the Chinese University of Hong Kong, providing funding and internship opportunities for their students.

Dr. Eric Chang, senior director of MRA and Microsoft's Asia Pacific R&D group, said he sees great potential for Hong Kong to develop and employ the internet of things, among other advanced technologies, given its universities' strong research capabilities and the potential synergy with neighboring Shenzhen, which has a high level of capacity to develop hardware.

But more support from the government is needed, Li said.

He said the government's proposed HK$5 billion Innovation & Technology Fund is far from enough to boost the sector, given an unsatisfactory entrepreneurial environment and a serious brain drain of researchers who leave the city to work abroad.