Personalized Real-Time Air-Quality Forecast for Exposure

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Abstract

Air pollution risk is particularly high in urban areas in or near regions of rapid development, such as Hong Kong (HK) and other cities in the Pearl River Delta (PRD). Severe regional emissions, heavy traffic, high population density and packed city morphology with deep street canyons often combine to create a shroud of pollution over HK. An earlier study by HKU, CUHK, HKUST and Civic Exchange noted that air pollution was associated *annually* with over 1,600 deaths, 64,000 hospital bed-days, 6.8 million doctor visits and HK\$20 billion in medical costs in HK (Loh et al., 2008).

Citizens often believe that there isn't much they can do about it — that pollution is an unavoidable part of daily life. We aim to change this passive mindset by creating a system that empowers the public with personalised air quality information. By combining state-of-the-art technologies, air quality forecasts, big data and more, the Personalised Real-Time Air-Quality Informatics System for Exposure – Hong Kong (PRAISE-HK) system will give Hong Kong residents real-time air quality reports from their neighbourhood level down to individual streets. This app will translate science into actionable information, helping people make personal choices about reducing their exposure to polluted air.

The rapid development of microenvironmental sensor technologies, computer modeling, big data analytics and widespread use of GPS-enable mobile devices are making it possible now for us to develop a pioneering AQ and health exposure informatics system that can allow individuals in HK to find out when and where the most harmful air occurs and will offer less polluted routes to avoid exposure in real-time. It can also help users plan for future activities by giving them personalised alerts that offer less polluted routes in advance. Knowledge is power. While individuals will benefit most directly from PRAISE-HK, the government benefits as well. The database will serve as a solid foundation to create effective air quality management strategies for public health.