



Towards a personalized environmental health information service using low-cost sensors and crowdsourcing

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Most European cities exceed the air quality guidelines established by the WHO to protect human health. As such, citizens are exposed to potentially harmful pollutant levels. Some cities have services (e.g., web pages, mobile apps, etc.) which provide timely air quality information to the public. However, air quality data at individual level is currently scarce or non-existent.

Making this information directly useful to individuals poses a challenge. For instance, if a user is informed that the air quality is “poor”, what does that mean for him/her, and how can this information be acted upon? Despite individuals having a unique relationship with their environment, the information on the state of atmospheric components and related hazards is currently mostly generic, and seldom personally relevant. This undermines citizens’ interest in their environment, and consequently limits their ability to recognize and change both their contribution and their exposure to air pollution.

In Oslo, two EU funded projects, CITI-SENSE (Engelken-Jorge et al., 2014) and Citi-Sense-MOB (Castell et al., 2014), are trying to establish a dialogue with citizens by providing them with the possibility of getting personalized air quality information on their smartphones. The users are able to check the air quality in their immediate surroundings and track their individual exposure while moving through the urban environment (Castell et al., 2014). In this way, they may be able to reduce their exposure such as by changing transport modes or routes, for example by selecting less polluted streets to walk or cycle through.

Using a smartphone application, citizens are engaged in collecting and sharing environmental data generated by low-cost air quality sensors, and in reporting their individual perception (turning citizens into sensors themselves). The highly spatially resolved data on air quality and perception is geo-located. This allows for simultaneous visualization of both kinds of the sensor information on a map.

These field experiences will allow us to evaluate the ability of crowdsourcing and low-cost sensor technologies to enhance existing air quality monitoring systems. They will also test to what extent this approach enables citizens to engage in more active environmental monitoring. Challenges include precision and accuracy of the measurements, scientific understanding of these novel data and provision of added value for the participants (Liu et al., 2014).

References:

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