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PROJECT SMARTAQNET: COMBINING EXISITING DATASETS AND A MOBILE MEASUREMENT STRATEGY INTO A SMART URBAN AIR QUALITY NETWORK

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Air quality and the associated subjective and health-related quality of life are among the important topics of urban life in our time. In the past years, a paradigm shift towards integrating mobile PM monitors to form distributed sensing networks has begun in air quality sensing [1]. In addition to new and promising measurement approaches, large-scale basic data is becoming available as well.This potentially enables the collection of fine-granular data and the development of information on causal chains.

The" SmartAQnet" research initiative [2] focuses on the subject of data access and data-based applications. Central to this is the development and utilization of partial, already existing (but not yet combined) data on the one hand and the collection and integration of relevant missing data on the other hand. This includes the integration of third-party sources and the development of novel measuring devices, as well as an improvement of the overall data quality and theidentification and implementation of meaningful interfaces between devices, databases and the end user. SmartAQnet creates a novel measurement and analysis concept within the model region of Augsburg, Germany. The project is funded by the German Federal Ministry of Transport and Digital Infrastructure (BMVI).
It connects open data, such as weather data or development plans, remote sensing of influencing factors, and new mobile measurement approaches, such as...

- distributed and/or participatory sensing with low-cost sensor technology (e.g. [3],[4]),
- so-called “scientific scouts” (newly developed autonomous, mobile smart dust measurement devices that are auto-calibrated to a high-quality reference instrument within an intelligent monitoring network) and
- demand-oriented measurements by light-weight UAVs

In addition to novel analytics, a prototypical technology stack is planned which, through modern analytics methods and Big Data and IoT technologies, enables application in a scalable way. On the data, new applications will be implemented. For this entire data-driven software chain, also new methods are explored. Specifically, these are big data analyses for quality improvement and model validation, as well as novel algorithms, e.g. for distributed calibration.

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