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Newsletter SmartAQnet

October 2018




Newsletter October 18
Smart Air Quality Network

Table of contents

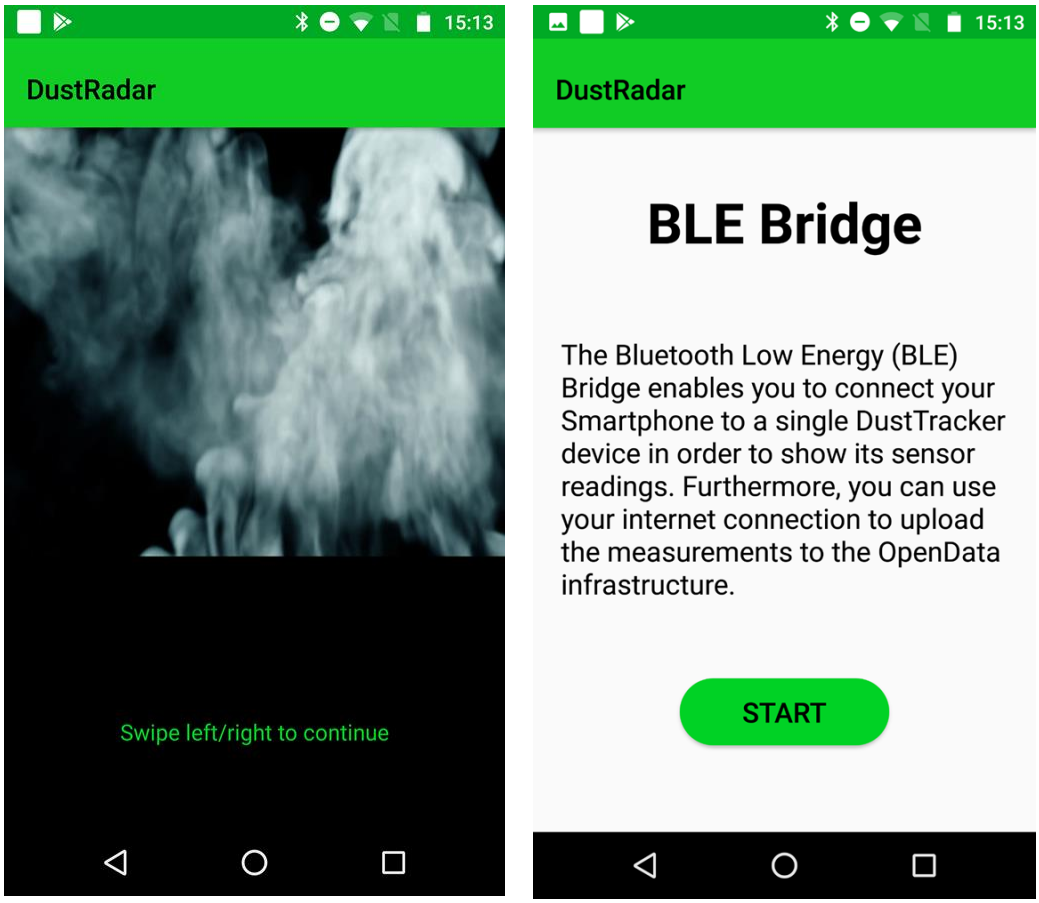
Project management

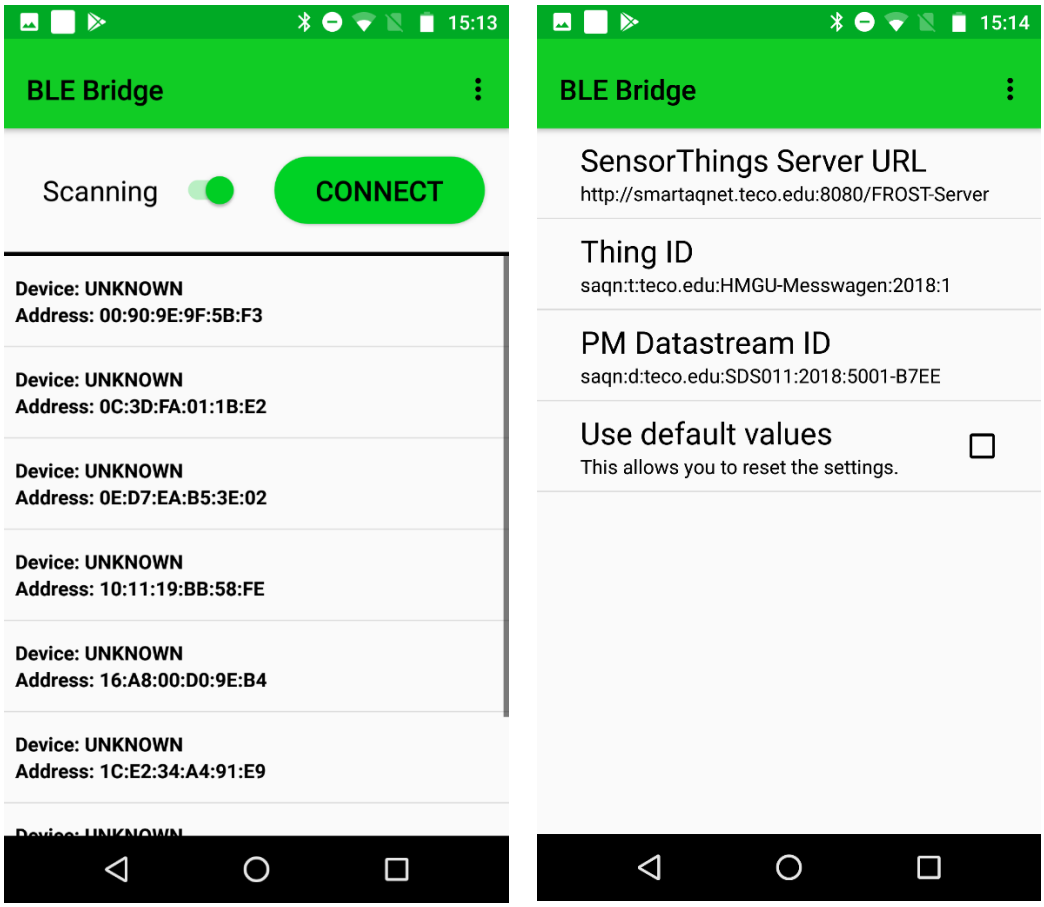
A further sub-contract of KIT/IMK-IFU with Technical University Graz about numerical simulations of air pollution exposure is under development.

Data mining and campaigns

The ceilometer CL31, which was running at IGUA for intercomparison since 07 August, was moved and installed in the Klostergarten on 20 September, to study the North-South profile of mixing layer height in Augsburg. The online data access to the ceilometers at IGUA, Aerosol measurement station at HSA and in the Klostergarten is realised and used for the ongoing intensive operational measurement month (IOM) September/October and in the future. Several weather information and forecasts were performed together with IGUA during the IOM as basis to call an IOP (26-27/09/2018).

TECO has successfully participated with its low-cost sensors in the first Intensive Operation Period (IOP). The new devices are controlled with an independent Android app via Bluetooth-Low-Energy (BLE), to ensure long battery power cycles during measurement campaigns. The app was also designed to empower citizen science measurements in the upcoming campaigns and allow the data load to the open data kappa architecture (FROST + Kafka).





Activities of the University of Augsburg:

- The comparative measurements between the CL31 and the CL51 on the roof station were finished.
- Preparations for the IOP on 26. /27. September 2018:
    - Visitation of possible UAV assent locations.
    - locations Kongress am Park and Prinzregentenplatz were selected and agreements were made with the owners.
    - Coordination of UAV flights with Augsburg airport.
    - Planning of the cycle route for the IOP, the route combines some of our daily measurement routes and the two UAV locations.
    - Acquisition of volunteers and schedule of shifts.

Performance of the IOP from 26.09.2018 07:00 to 27.09.2018 07:00 clock with 52 UAV ascents up to 300 m (and 2 up to 500 m at the university sporting ground) and about 240 km bike measurements.

Data aggregation and analyses

The sub-contract of KIT/IMK-IFU for ZAE to collect data about residential heating and anonymization started and the further sub-contract of ZAE with the chimney cleaner company Augsburg/Schwaben is

working also. Mr. Fichtl of the chimney cleaner company Augsburg/Schwaben informed that the data collection by the 26 regional chimney cleaner masters (BKM) is running and first positive feedbacks exist. This data collection provides geo-referenced information about number of chimneys for oil, gas and fossil fuel heating as well as the number of connected heating systems (related to fuel types) for ZAE. The nominal power will be available for ZAE as sum for each chimney. ZAE will calculate the temporal variation of corresponding emissions with these data by using emission factors from literature, typical residential heating variations of each place and in consultation with the experts. Finally, the data will be anonymised corresponding to the requirements of the data security officer of the chimney cleaner company and in cooperation with ZAE, Andreas Philipp and Ulrich Uhrner („smearing", clustering, etc.) and converted into a format, which is usable by the modellers.

The discussion about the use of data from traffic counting loops (Ulrich Uhrner, Johannes Werhahn, Andreas Phillip), to determine the emission inventory and to simulate air pollution exposure numerically, is continuing to

- Validate GIS-based air pollution maps,
- Evaluate scout measurements and
- Determine a summary picture of air pollution exposure from measurements and numerical simulations as well to close gaps of the new measurement network on the basis of scouts.

Following this, tests with an example data set were performed.

Data application

Now, there are no news available. However, we will keep you informed.

Data oriented dissemination and application

The oral presentation at the conference Remote Sensing of Clouds and the Atmosphere, SPIE Europe, Berlin, Germany, 10 – 13 September 2018 was given by Klaus Schäfer: J. Redelstein, M. Budde, J. Cyrys, S. Emeis, T. Gratza, H. Grimm, M. Hank, S. Hinterreiter, C. Münkel, M. Pesch, E. Petersen, A. Philipp, T. Riedel, J. Riesterer, K. Schäfer, J. Schnelle-Kreis, U. Uhrner, J. Werhahn, V. Ziegler, M. Beigl: Smart Air Quality network for spatial high-resolution monitoring in urban area.

Activities of the University Augsburg:

Two contributions will be presented at the 37 annual meeting of the Arbeitskreis Klima from 26.10. to 28.10.2018 at Schloss Schney (Lichtenfels):

- Poster: Petersen, E., A. Philipp, J. Redelstein: Spatial data analysis of the first SmartAQnet measurement campaign in September 2018.
- Oral presentation: Redelstein. J., E. Petersen, A. Philipp: Mobile particulate matter measurements in the SmartAQnet project and their temporal variability.

Further information