

Project-Consortium SmartAQnet – Aerosol Academy

18. Newsletter SmartAQnet

August to September 2019





Newsletter August to September 2019 Smart Air Quality Network

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Editorial

Dear friends of fine dust measurement. It is my pleasure to present you **the 18th newsletter** of the SmartAQnet project. In August a lot of work was done in the field of data analysis and evaluation. In addition, we prepared an application for a follow-up project, which we submitted on September 16. That month also saw many activities to disseminate our results in the scientific community.



One highlight was certainly the **open day at the environmental office in Augsburg**, where interested parties could get an idea of the work in SmartAQnet.

By the way: on the website <https://www.smartaq.net> you are always up to date.

Sincerely yours,

Katja Kornetzky

WORK PACKAGE 0: Project management

Several Jour Fixes were carried out with the project team.

In addition, we had several meetings for a **follow-up application to mFUND, which we submitted on September 16.**

WORK PACKAGE 1: Data mining and campaigns

The data from the July intensive measurement campaign (IOP) have now been evaluated. In the meantime, data of 30 sensors are available online. The data is stored on the [BW sync and share](#), an online storage service that enables simple data exchange between scientists.

WORK PACKAGE 2: Data collection / Devices

A total of 27 Scientific Scouts of the Grimm company are now active in Augsburg. One advantage of these devices is that they are relatively handy compared to the previous models and still deliver very accurate results.

We would like to take this opportunity to introduce you to our most important measuring devices. Our 'measurement zoo' has now grown to a considerable size. If you click on the hyperlinks, you will get more information about the sensors.

Name	Data Acquired	Sensitivity	Costs	Comment
EDM180	PM ₁ , PM _{2.5} , PM ₁₀ , Humidity, Temperature	High	High	Every 10 Seconds
UAVs (Drones) with Alphasense OPC-N2/-N3	PM _{2.5} , PM ₁₀ , Humidity, Temperature	Medium High	Medium	Necessary for 3D-Measurements IGUA
Mobil Sensors with Alphasense OPC-N2/-N3	PM _{2.5} , PM ₁₀ , Humidity, Temperature	Medium High	Medium	Volunteers move through the city (IGUA)
Official Air Pollutant Measuring Station	PM _{2.5} , PM ₁₀ , Humidity, Temperature and many additional parameters, s.u.	Very High	Very High	Hourly averages
Scientific Scout	PM _{2.5} , PM ₁₀ , Humidity, Temperature	Medium	Medium	Every 10 Seconds
Low Cost Sensor	PM _{2.5} , PM ₁₀ , Humidity, Temperature	Low	Low	Every 10 Seconds

Station	NO ₂ [µg/m ³] 1h-MW	PM ₁₀ [µg/m ³] TMW Vortag	PM ₁₀ [µg/m ³] 24h-GMW	Ozon [µg/m ³] 8h-GMW	Ozon [µg/m ³] 1h-MW	CO [mg/m ³] 8h-GMW
Bezugswert	200	50	--	120	180	10
Augsburg, Bourges-Platz	17	7	4	50	45	
Augsburg, Karlstraße	43	9	5			0,4
Augsburg, Königsplatz	20	6	4			0,2
Augsburg, LfU	7	5	3	59	55	0,1
Bad Hindelang, Oberjoch	10	3	3	54	64	
Kempten (Allgäu), Westendstraße	6			62	63	
Lindau (Bodensee), Friedrichshafener Straße	12	7	5			0,2
Neu-Ulm, Gabelsbergerstraße	22	8	5	36	50	
Oettingen, Goethestraße	3			54	59	

Table 1: Sensor data of LFU Stations in Augsburg

(from: <https://www.lfu.bayern.de/luft/immissionsmessungen/messwerte/index.htm>)

WORK PACKAGE 3: Data aggregation and analyses

The KIT/ TECO also included the new data from the measurement campaign (IOP) into the data platform in August. These data are now parsed, i.e. the information of a file is transferred into the SAQN data structure to enable further analyses.

The sensors of feinstaub.info are now integrated in SAQN and the data is available online in the [Dashboard](#).

The [firmware of the low-cost sensors](#) has been updated. In the meantime, the last bugs of the configuration have been fixed. Firmware updates via W-Lan OTA are now possible. So you don't have to connect to the sensor via USB, but can select it via **W-LAN**.

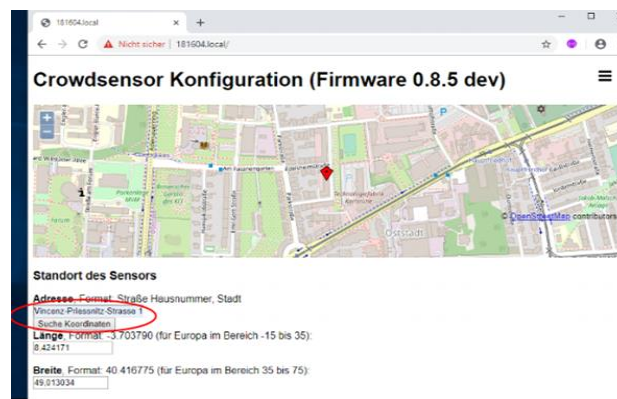


Figure 1: Configuration window for Low Cost Sensors

WORK PACKAGE 4: Data application

The [Dashboard](#) for live view of fine dust data has been extended with many functions. Now it is possible to query the temporal course of the measured values. PM2.5, PM10, temperature or humidity can be selected. Afterwards a measurement period can be selected.

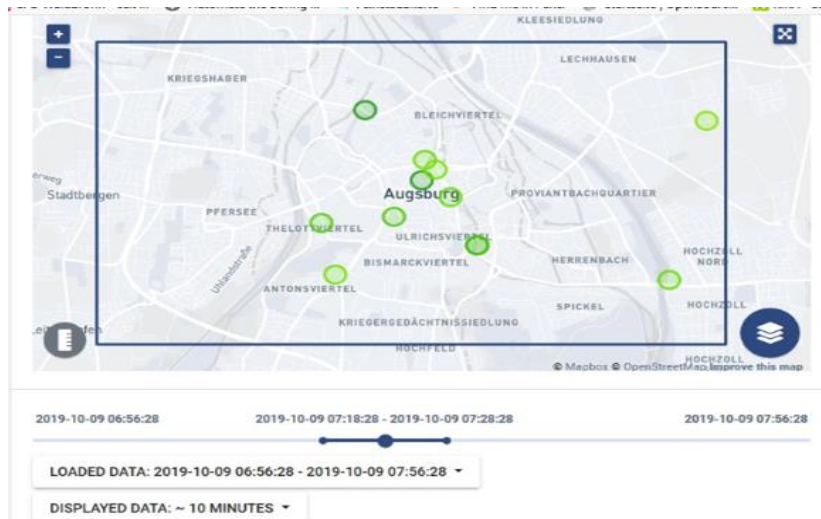


Figure 2: Screenshot of Dashboard of SmartAQnet: Live- View of the sensors in Augsburg with time course of particulate matter-concentration.

WORK PACKAGE 5: Data oriented dissemination and application

- At the **Open Day at the Augsburg Umweltamt** on 20 September, interested visitors were also presented with a measuring station (HMGU) and the latest results of drone flights (geographers from the University of Augsburg). The KIT/ TECO team showed how easy it is to configure a new low-cost sensor and that the data on fine dust concentration (PM2.5, PM10), temperature and humidity can be seen online immediately. Many guests were very interested, especially about the live data.
- Dr. Johannes Riesterer gave a lecture on Gaussian process regression for heterogeneous measurement networks of environmental data at the **International Workshop on Data-driven Modeling and Optimization in Fluid Mechanics** on September 16. The aim was to evaluate data from different sources.
- Representatives of the project were also in Greece: At the **GRACE Summer School** of the KIT Karlsruhe and the Aristoteles University of Thessaloniki (AUTH) on September 6, Dr. Till Riedel gave a summarizing lecture on the previous work of SAQN. The Summer School deals with climate change, climate impacts, clean energy and clean air in cities.
- At the **SPIE Symposium "Remote Sensing" in Strasbourg** from 09. to 12.09. Prof. Dr. Klaus Schäfer gave a lecture, which in cooperation with IGUA will also be published in the conference proceedings, on data evaluations for the determination of the three-dimensional distributions of particulate matter and meteorological parameters: Use of measurements on the ground, ground-based remote sensing and unmanned aerial vehicles.

Further Information

- At the [Clean Air Experts Day](https://www.clean-air-experts.de) we will be represented with our own booth and present further results: <https://www.clean-air-experts.de>
Just come by and have a look.