Collective awareness platform for outdoor air pollution

Sprawozdania

Informacje na temat projektu

hackAIR

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Strona internetowa projektu

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Podsumowanie kontekstu i ogólnych celów projektu

Air pollution is the single environmental issue Europeans worry about the most. Nearly six out of ten Europeans do not feel sufficiently informed about air quality issues in their country. Poor air quality has serious health and lifespan implications and causes harm to the natural environment. However, it remains difficult for citizens to access improved information on air quality and assess their exposure to

air pollution where they live.
hackAIR joined the movement to improve air quality data in Europe through participatory sensing technologies and citizen engagement. hackAIR helps to fill current gaps in areas where the distance between official air quality monitoring stations may be significant; improve access to data from different sources and provide up-to-date air quality information.
The overall objective of hackAIR was to provide an open technology platform that citizens and interested parties can use to access, collect and improve air quality information in Europe, with the ultimate goal to raise collective awareness about air pollution and promote a change towards environmentally friendly behaviours. hackAIR is all about synergies: it combines official open air quality data with a number of community-driven sources. hackAIR's open hardware sensors build on the Nova SDS011 PM sensor, the most studied low-cost air quality sensor at the moment. In addition to a static version of the sensor that connects to citizen's home Wi-Fi, hackAIR also developed a battery-driven version that connects via Bluetooth and can thus be used on the road, and a low-tech measurement setup from cardboard and petroleum jelly proved useful in research and education settings. hackAIR also prototyped an innovative approach to estimate particulate matter levels from mobile phone pictures of the sky, and deploys it at scale by analysing a large number of publicly available images from webcams and social media platforms like Flickr. Finally, a data fusion algorithm calculates estimates for air quality for locations in which no measurements are available. hackAIR is, thus, able to provide a continuous map of air quality information.

Prace wykonane od początku projektu do końca okresu sprawozdawczego oraz najważniejsze dotychczasowe rezultaty

As hackAIR is a community-driven solution, its participatory approach started by designing the requirements for the hackAIR platform in collaboration with users and in line with technical possibilities. At the same time, workshops with users and research into successful engagement strategies have helped the consortium in designing the user interface and preparing behaviour change recommendations that are provided through the platform. In addition, outreach to interested parties and related projects built a strong network of stakeholders to assist with interoperability between projects, including a newly established air quality working group of the European Citizen Science Association.
Pilot projects in Germany and Norway contributed with a series of workshops and citizen engagement activities to raise local awareness on air quality issues and mobilise health-conscious communities. hackAIR also participated in a number of hackathons and summer schools, while the hackAIR platform continues to provide a customisable web application for local air quality information and a mobile app that citizens can use to access air quality information and contribute with measurements. Air quality data can be also accessed using an open API, and the full datasets of measurements are available as open data. Source code and hardware designs are available for download under an open license and incorporate dozens of community suggestions and improvements.
Launched in early 2018, the hackAIR platform has engaged thousands of Europeans, and not only, to map their neighbourhoods' air quality by taking pictures of the sky, provide their own measurements through open hardware sensors and see how air quality changes over time. More than 800 citizens across Europe started measuring particulate matter in their neighbourhoods using one of the hackAIR

open hardware designs, while about 1.500 people helped in air pollution estimation by uploading sky photos to the hackAIR mobile app. Individual citizens have used the information to avoid polluting behaviour, reduce their exposure to air pollution and participate in the public discourse on improving air quality based on the collected data. Scientists and policy makers have used the resulting air quality data to gain insights on air quality patterns and inform public policy.

Innowacyjność oraz oczekiwany potencjalny wpływ (w tym dotychczasowe znaczenie społeczno-gospodarcze i szersze implikacje społeczne projektu)

The hackAIR platform consists of a customisable web application for local air quality information and a mobile app that citizens can use to access air quality information or to contribute measurements. Air quality data can be accessed using an open API, while the collected data have been anonymized and are available for futher research. Source code and hardware designs are available for download under an open license.
hackAIR combines official air quality data with a number of community-driven sources, including easy-to-build open hardware sensor modules that transmit regular air quality measurements via Bluetooth or Wifi; air quality information derived from mobile phone pictures of the sky and webcams; and a low-tech measurement setup from Commercial-off-the-Shelf components. hackAIR also includes official air quality information using the OpenAQ platform. In addition, a data fusion algorithm calculates estimates for air quality for locations in which no measurements are available. hackAIR is thus able to provide a continuous map of air quality information.

The hackAIR platform is becoming an essential tool to raise awareness on air quality: citizens can find information about the air quality in their neighbourhood – and together with other members of their community, they can contribute to improving air quality data where they live. This results in a better understanding of air pollution hotspots in cities in Europe, and targeted behaviour change to reduce exposure to dangerous air pollution and improve air quality overall.

hackair-logo-rgb.png

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