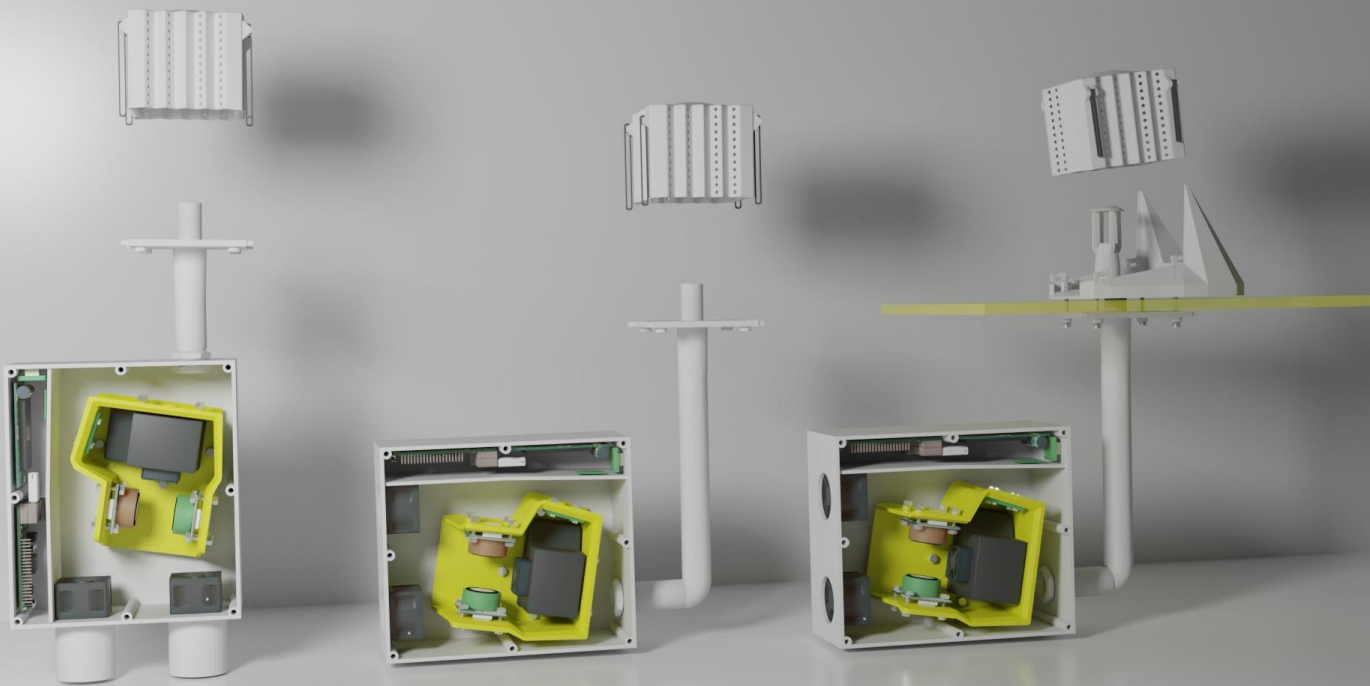


ExpoLIS

Assessment of Human Exposure to Air Pollution
to Change the Way People Move in cities

Newsletter 2

August 2019







Welcome to the second edition of the ExpoLIS Newsletter!

This newsletter is based on the ExpoLIS project. This and the future editions will aim to present the work that has been developed, the main outputs and dissemination activities.



IN THIS ISSUE

In 2018, two partners joined to propose a new project to the Portuguese Foundation for Science and Technology (FCT). In the last years there has been an improvement in Air Quality in urban areas due to the latest emission control strategies. However, the citizens are still exposed to levels of air pollution above the limits imposed by the legislation. The ExpoLIS project was created with the objective of developing a system that will characterize Air Quality, support air pollution improvement measures and ultimately decrease the citizens exposure to air pollutants.

-  Get to know the ExpoLIS sensor node
-  “*Construir conhecimento sobre qualidade do ar: A Ciência e o cidadão*”: the first paper published in the context of the ExpoLIS project
-  ExpoLIS in the *7th Iberian Meeting on Aerosol Science and Technology*
-  Meet the team: Marta Almeida, the project manager

The ExpoLIS Sensor Node

The design of the sensor node prototype cycle started at the beginning of our project.

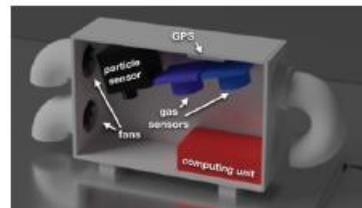
The first decision concerning the sensor node was what type of air pollutants it should monitor. Thus, it was decided that it must include the following physical quantities:

- 📅 Date and time;
- 📍 Geographical location (GPS);
- 📅 Particulate Matter with diameter less than $1\mu\text{m}$ (PM1);
- 📅 Particulate Matter with diameter less than $2.5\mu\text{m}$ (PM2.5);
- 📅 Particulate Matter with diameter less than $10\mu\text{m}$ (PM10);
- 📅 Carbon Monoxide (CO);
- 📅 Nitrogen Dioxide (NO₂);
- 📅 Pressure;
- 📅 Humidity;
- 📅 Temperature.

The Prototype

The first prototype was designed to be installed outside the bus in its rooftop.

The sensor node was suppose to be continuously measuring the pollutants concentrations in the outdoor. In this way, it had to withstand adverse weather and impacts with foliage, which was considered in the development of the prototype.



Construir conhecimento sobre qualidade do ar: A Ciência e o cidadão

The first paper publish in the context of the ExpoLIS project

Air pollution is a major threat to human health in Europe.

Although there have been many efforts to decrease the air pollution levels, the levels of air pollution are still above the limits set by the national legislations and the World Health Organization guidelines.

Particulate matter (PM) is one of the air pollutants that is monitored by fixed monitoring stations, which characterize air quality in cities.

In this article, Marta Almeida, presents several relevant subjects about air quality, referring both Science and the involvement of the citizens.

Construir conhecimento sobre qualidade do ar: a ciência e o cidadão

© 29 fevereiro 2020, sábado Alterações climáticas Ar Gestão



A poluição atmosférica é hoje o principal risco ambiental para a saúde humana na Europa.

Apesar dos esforços para diminuir os níveis de poluentes na atmosfera, através de medidas como a implementação de tecnologias mais limpas na indústria, o investimento em energias renováveis, o reforço da eficiência energética, o desenvolvimento de veículos mais eficientes, a produção de combustíveis menos poluentes, a promoção de formas de mobilidade alternativas e a restrição da mobilidade privada tradicional, continua a verificar-se o incumprimento dos valores limite estabelecidos pela Organização Mundial de Saúde e os consequentes impactos negativos na saúde da população, particularmente nas zonas urbanas.

Segundo o mais recente relatório da Agência Europeia do Ambiente sobre a qualidade do ar na Europa, em 2016 ocorreram 5830 mortes prematuras em Portugal resultantes da exposição a poluentes atmosféricos (4900 das quais relacionadas com partículas finas), o que representa um valor 10 vezes superior à mortalidade verificada nas estradas portuguesas no mesmo ano. Segundo a Organização Mundial de Saúde, as doenças cardiovasculares são a causa de 80% dessas mortes prematuras, às quais se seguem as doenças respiratórias e o cancro.

As partículas finas (PM_{2,5}) são um dos principais poluentes atmosféricos e os seus efeitos são observados mesmo em níveis muito baixos de exposição, não sendo possível definir uma concentração abaixo da qual não ocorram efeitos adversos à saúde.

A exposição da população a PM_{2,5} nas nossas cidades é normalmente avaliada através de medições das concentrações de poluentes, efetuadas pela Rede Nacional de Monitorização da Qualidade do Ar. No entanto, esta abordagem não compreende a totalidade da exposição da população.(...)

Artigo completo na [Indústria e Ambiente nº120 jan/fev 2020](#)

Marta Almeida, investigadora no Instituto Superior Técnico

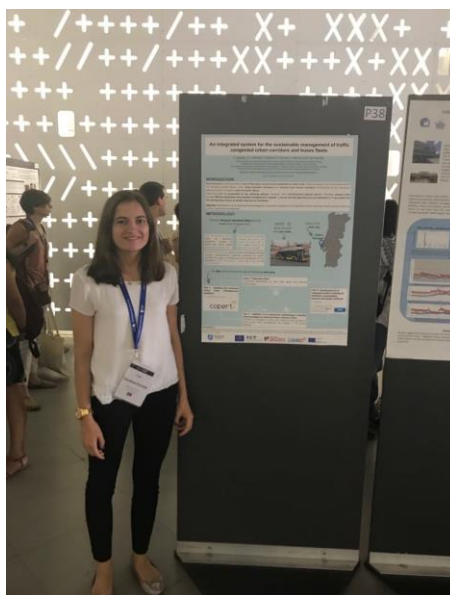
Read the complete article (in portuguese) here:

<https://www.industriaeambiente.pt/noticias/revista-n120-janeiro-fevereiro-2020/>

ExpoLIS in the 7th Iberian Meeting on Aerosol Science and Technology

RICTA2019 – 7th Iberian Meeting on Aerosol Science and Technology was a conference held in Lisbon from 9th to 11th July 2019. The ExpoLIS project was involved in its organization and also presented the work developed in this project.

Carolina Correia, one of the ExpoLIS PhD students, was there with two poster presentations entitled ***An air quality exposure sensing system aiming to change the way people move in cities*** and ***An integrated system for sustainable management of traffic congested urban corridors and buses fleets***.



Carolina also made an oral presentation in the framework of the project ExpoLIS which was entitled ***Exposure and inhaled dose of particulate matter by commuters in Lisbon***.



Meet the team





Marta Almeida is the project coordinator.

Marta Almeida is researcher at C2TN, Instituto Superior Técnico, Universidade de Lisboa, Portugal. Over the last 20 years, she has dedicated her research to the atmospheric chemistry. At the moment, the complete characterization of the particles at the receptor is used by the researcher to elucidate the sources of the pollutants and the processes associated with their formation, to assess local, regional and long-range transport and to identify mitigation options focusing on the improvement of the air quality.



“Air pollution has moved from being seen as an environmental problem to a health concern. Consequently people are more worried about the quality of air they breathe. Coordinate ExpoLIS project creates an opportunity to act and improve the air quality for everyone.”

What will you find in the next issue?

-  Meeting researchers from other projects
-  *ExpoLIS in the Third Workshop of C2TN 2019*
-  ExpoLIS in the *International Congress on Environmental Health 2019*
-  Meet the team: Pedro Santana, the project co-manager

Keep in touch!



<http://expolis.ctn.tecnico.ulisboa.pt/>



expolis@ctn.tecnico.ulisboa.pt



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