SNIFFDRONE: Drone for measuring the concentration of odour

Challenge

Current techniques for sampling and measuring odours are based either on fixed localised sensors (electronic nose) or on the collection of air samples for subsequent laboratory analysis. E-noses readings are highly dependent on the meteorological conditions of the place of interest (e.g., wind direction and speed) which results in frequent incorrect readings. Moreover, odour sources are often hard to be accessed requiring scaffolds or poles that are not always sufficient to correctly sample the area of interest. So, innovative solutions are required to overcome limitations of odour sensing such as low space and time resolution and need of support structures.

Asset

IBEC researchers have developed a drone for measuring the concentration of odour in real operation conditions. The drone includes a measurement chamber with a set of sensors configured to measure multiple parameters from air samples and a geopositioning system that allows a precise mapping of the odour signals.

Interestingly, the features combination of the drone allows collecting measurements in hardly accessible locations with no perturbation by the propulsion means of the drone.

Market

Our technology lies at the intersection of three large and fast-growing markets: e-noses, commercial drones, and odour control system markets. In 2020 their global market values ranged from US$ 17.8 million (electronic-noses) to US$ 2.72 billion in 2020 (drones) at a CAGR of 12.44% and 23.7%, respectively.

The use of odour control systems covers several application fields, from atmospheric contamination to food &agriculture and detection of explosives, up to natural disasters and healthcare. Atmospheric contamination due to air pollution is a raising global concern due to its long-term environmental and health impacts. Indeed, gas emissions due to human activities are the main cause for global warming whereas a number of diseases including cancers, cardiovascular and respiratory disease are strongly correlated to the presence of PM2.5, PM10, black carbon, NO and NO_2, O_3 in the air.

Asset Value

- Electronic nose with **multiple sensors** able to measure the concentration of gas phase chemical compounds, temperature, humidity, and pressure
- **GPS** localisation, allowing for precise chemical mapping
- **Artificial Intelligence** module able to effectively process multiple data and provide precise odour values
- The drone's configuration **avoids any perturbation** due to its propulsion means during the measurements
- Readings are corrected considering deviations due to sensor ageing
- Easy **applicability to several fields** allows for multiple exploitation agreements

Uses

- Atmospheric contamination control
- Food & agriculture
- Natural disasters
- Explosives
- Healthcare

Team

Santiago Marco - Scientific Leader

Agostino Romeo - Tech Transfer Manager

Eduardo Salas - Head of Tech Transfer

Stage of Development

TRL: 5

- Prototype assembled
- Proof-of-Concept with promising results on real time 3D odour maps of wastewater treatment plants emissions

Ongoing/next steps:

- Optimisation of calibration procedures of gas sensors
- Prototype industrialisation

Intellectual Property Status

Patent filed in April 2021

Current status: PCT filing

Patent owners: IBEC, UB, DAM

Exploitation Plan

Patent available for licensing with technical cooperation / technical co-development

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