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## What is E-NOSE ?

E-nose is a prototype of low-cost electronic nose developed by Telenatura EBT and the Miguel Hernández University (Spain).

## How does it work?

The device consists of three principal components, a sample delivery system (sampling unit), a detection array of non-specific MQ-series SnO<sub>2</sub> gas sensors, and a data processing unit (pattern recognition software).

The sensors respond to the volatile organic compounds (VOCs) of a natural product.

E-nose gets this data in order to obtain a unique pattern of a product. Posterior statistical analysis of these data allows to identify the sample measured by comparison with the stored product patterns

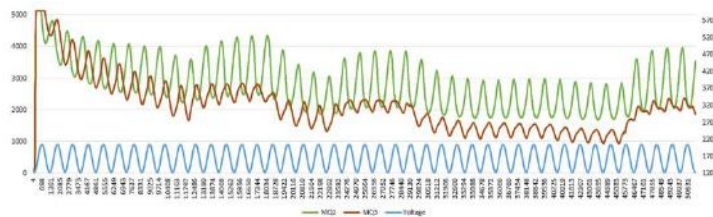


Fig. 2. Typical sinusoidal waveforms MQ2 and MQ3 deformation.

The system uses sinusoidally varying heater voltage cycles on some MQ sensors to achieve a sensitivity, selectivity and susceptibility to drift improvement.

By using discrete Fourier transform analysis of the sensor responses further information can be deduced in order to find out unique patterns.

## In which fields E-NOSE can be used ?

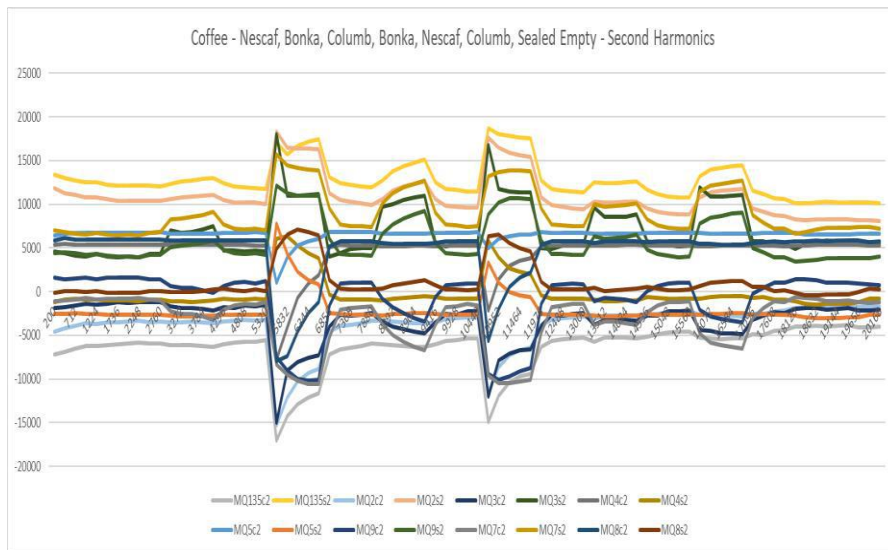
Our device has been tested in an olive oil type discrimination experiment. The unit appeared capable of a high degree of accurate prediction (in the region of 90%) when asked to distinguish between the group "virgin/extra virgin" and the group "blend/pomace" oils.

Further experiments have been carried out for the detection of the Lethal Bronzing Disease (LB) in the palms and quality analysis of pet's food.

## Further applications?

The e-nose's team works currently together with the Universidad Politécnica de Valencia (Spain) trying to adjust the device to urine analysis for the detection of prostate cancer.

In paralell, the team is working on a proposal to incorporate an electronic nose to monitor the roasting coffee process.



## Public documentation

- DFT based classification of olive oil type using a sinusoidally heated, lowcost electronic nose ([LINK](#)).
- Preliminary results for the detection of lethal bromzing disease in Florida's light palm using a low-cost electronic nose. ([LINK](#)).
- Analysis of the pet's food using an electronic nose ([LINK](#)).

## E-nose's team

Our team is formed by different researchers:

- PhD. Antonio Ruiz Canales from Miguel Hernández University.
- PhD. Martin J. Oates from Miguel Hernández University.
- Industrial Engineer Carlos Molina from Telenatura EBT.

We collaborate as well with:

- PhD José Ramos from the Southeastern University of Florida.
- Agricultural and biological\_engineer Nawaf Abu-Khalaf from Palestine Technical University-Kadoorie (PTUK)

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