

Integrated Micromachined Sensors for Pest Detection

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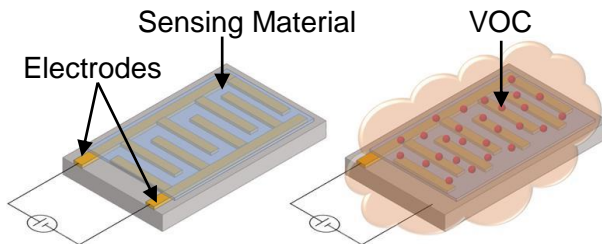


Objective

Providing a new solution at e-Minds for the early detection of biological threats in a non-invasive, real-time and cost-effective manner in a greenhouse ecosystem to monitor crop health and sustain the crop yield.

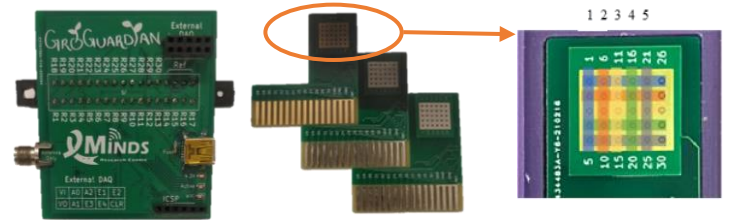
Sensing Mechanism

- Electrochemical sensors comprise of a set of electrodes and a sensing material in between.
- Electrical properties of the sensor change due to the interaction with the target VOC. This variation is correlated to concentration of the target VOC.



Schematic view and working of an electrochemical sensor

GroGuardian Pest Detector



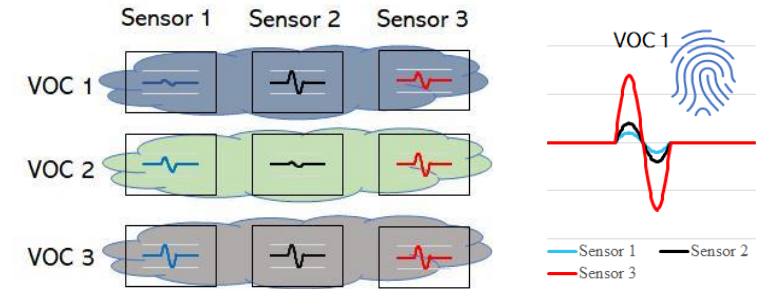
The GroGuardian eNose sniffer and customized cartridges, coated with multiple sensing materials

- The GroGuardian is a **portable, IoT-based** eNose sniffer with **real-time** detection and **remote monitoring** capabilities.
- GroGuardian utilizes **customizable, small** and **inexpensive** cartridges where an array of sensing electrodes can be coated with different sensing layers, to detect and measure the desired VOCs.

Acknowledgment

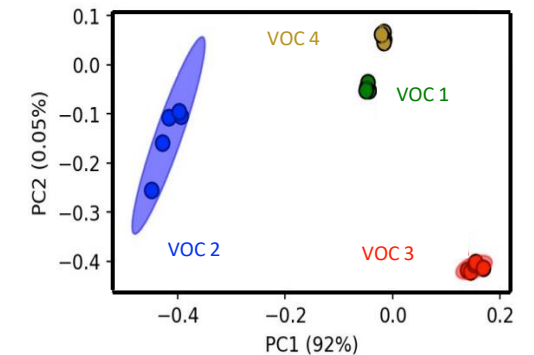


Data Analysis



Response from an exposed array of sensors to a range of VOCs, which generates a unique fingerprint for each VOC

- Using the resistance response of the array, a unique fingerprint for each VOC is generated and used to detect trace amounts of individual VOCs in the greenhouse.



The PCA plots for the normalized resistance response for 4 different VOCs