Artificial snot enhances electronic nose

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Researchers at The University of Warwick and Leicester University have used an artificial snot (nasal mucus) to significantly enhance the performance of electronic noses.

The researchers have coated the sensors used by odour sensing "electronic noses" with a mix of polymers that mimics the action of the mucus in the natural nose. This greatly improves the performance of the electronic devices allowing them to pick out a more diverse range of smells.

A natural nose uses over 100 million specialised receptors or sensors which act together in complex ways to identify and tell apart the molecules they encounter. Electronic noses, used in a number of commercial settings including quality control in the food industry, use the same method but often have less than 50 sensors.

This means that electronic noses can discern a much smaller range of smells than the natural nose. However the University of Warwick and Leicester University team have found a way to replicate in their electronic devices how the natural nose's mucus enhances our sense of smell.

In the natural nose the thin layer of mucus dissolves scents and separates out different odour molecules in a way they arrive at the noses receptors at different speeds/times. Humans are then able to use this information on the differences in time taken to reach different nose receptors to pick apart a diverse range of smells.

The Warwick and Leicester team found that have created an artificial mucus layer to mimic this process. They placed a 10-micron-thick layer of a polymer normally used to separate gases on the sensors within their electronic nose.

They then tested it on a range of compounds and found that their artificial snot substantially improved the performance of their electronic nose allowing it to tell apart smells such as milk and banana which had previously been challenging smells for the device.

University of Warwick researcher Professor Julian Gardner says: "Our artificial mucus not only offers improved odour discrimination for electronic noses it also offers much shorter analysis times than conventional techniques".

The final device including the sensors and the artificial mucus is contained in a relatively thin piece of plastic just a few centimeters square and costing less than five UK pounds (10 US Dollars) to produce.

Source: University of Warwick