Electronic Noses for Control

From NASA, October 2004:

http://science.nasa.gov/headlines/y2004/06oct_enose.htm

The website focuses on the research of Dr. Amy Ryan in producing electronic noses. It indicates that various polymer films are used to detect and identify particular gases. This device is much more sensitive than the human nose making it ideal for substances like ammonia which could reach lethal levels without humans being able to smell it. Potential uses for the device vary a lot including uses in space stations to warn astronauts when it detects lethal levels of gases. It also may have uses in intelligent safety systems as an extremely effective sensor.

From BBC News, Published May 2007:

http://news.bbc.co.uk/2/hi/technology/6614567.stm

This site is a news report on the development of electronic noses. Scientists are improving electronic noses by adding a mucus polymer that simulates mucus found in the human nose. This development has made it so electronic noses can identify different smells more accurately. The article then explains how electronic noses work by using neural networks to analyze data obtained from sensors to identify patterns of molecules. They can even be used by doctors to ‘sniff out’ particular diseases or infections in patients. This would give doctors another tool to identify things such as “eye infections, skin diseases, and urinary infections.”

From the American Physics Institute, February 1999


This website explains how electronic noses are an important emerging technology that could have many commercial applications. It begins with an overview of how electronic noses work. They use sensors to detect smells like the human nose, then use an artificial neural network to identify the smell much like the human brain does. The file indicates that there is much potential for electronic noses in the food industry, where it could replace human experts in quality control. There are many companies competing to produce these noses for different purposes in this emerging technology. The article also describes how there are still challenges to be overcome, such as the problem that the sensors of the electronic nose are very sensitive and thus have short lifetime.
From wikipedia


This site contains the definition of electronic nose as a devise that detects odors and flavors. The website explains the 3 major parts of the system (The sample delivery, the detection system and the computing system). It also describes its different applications which include: Its use in Research & Development laboratories, Quality Control laboratories and process & production departments for various purposes. The website also has credible sources where it gets its information (http://www.alpha-mos.com/technology/instruments.html). This website also has a list of some of the most commonly used sensors, which includes: metal oxide semiconductors (MOS), conducting polymers (CP), quartz crystal microbalance, surface acoustic wave (SAW), and field effect transistors (MOSFET).

From R&D magazine published 1998, Olfactometry Options
Perfect Product Development, Quality

http://www.fivesenses.com/rdmag.htm

This site focuses on the diverse technologies for artificial smelling. It gives a brief history of the evolution of odor smelling from the times humans were used by companies, which was a subjective, to now use of electronic nose. It also informs us that the decades' use of technology designed to refine the olfactometry process has lead into two different tool groups. On one path of development lie electronic noses and GC/MS equipment specialized to detect chemical "fingerprints" that produce odors and the other fork lie technologies that operate in conjunction with traditional human sensory panels, providing baseline odors and monitoring devices to quantify and qualify human panel results.

The site also describes the electronic nose system technology as a major tool used by manufacturing industries for quality control purposes. It also describes how human olfactive panels are used for smelling. These panels provide five variables regarding each sample namely: the threshold, intensity, persistence, hedonic tone, and character descriptors.