A review of electronic nose sensor technologies and signal processing techniques

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Abstract
The first generation of electronic nose (e-nose) systems have been developed and deployed for commercial and industrial applications. However, the sensitivity and selectivity of these systems pale in comparison to their biological counterparts, and limit the potential use of the technology. E-nose sensors are normally a compromise between sensitivity and selectivity that jeopardizes overall performance. However, the main issue for improved performance is the lack of selectivity of the pattern recognition algorithms utilized in e-noses. This presentation first reviews current e-nose sensor technology and then explores the advantages of dynamic signal processing techniques, such as the echo state network, to improve sensor selectivity.