

Digital scent technology

Digital scent technology is one of the emerging technologies, which utilise digital medium to generate and sense different types of odours. The products can be defined into two categories: Electronic Nose and Scent Synthesizers. Although at the start of 2020, digital scent technology was largely at the concept/R&D stage with slow market uptake, Covid-19 may spur a renewed interest in this technological field.

E-nose

Electronic nose or e-nose is an intelligent sensing device that analyses and detect the chemical content of a specific odour. It generally consists of a delivery system, detectors such as an array of gas sensors,

and computer processors to convert the identity of volatile compound(s) to a digital value. E-nose has received considerable attention in the field of sensor technology, where there have been significant improvements in the sensor design, software innovations, micro-circuitry design and systems integrations. Its utility thus far has been used to detect hazardous or poisonous gas/vapour, which is not possible or challenging for human nose to detect. It has been used in medical diagnostics to detect biomarkers for diseases such as cancer¹, food and beverages to detect quality changes in food products² and military to detect presence of explosives.

Recent activities from the POTION Team!



The POTION project was highlighted in the Horizon Magazine in March 2021. Prof. Enzo Pasquale Scilingo from University of Pisa was interviewed where he discussed the research undertaken to identify happiness and fear body odours and how they influence other people's emotional state. You can read the details of the interview at Horizon-The EU Research & Innovation Magazine: [Bottling the smell of happiness to help treat depression.](https://horizon-magazine.eu/article/bottling-smell-happiness-help-treat-depression.html)

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¹ Goor R. et. al. (2017) Training and Validating a Portable Electronic Nose for Lung Cancer Screening. Journal of Thoracic Oncology. 13 (5): 676-681.

² Tan J. et. al. (2020) Applications of electronic nose (e-nose) and electronic tongue (e-tongue) in food quality-related properties determination: A review. Artificial Intelligence in Agriculture. 4:104-115.

Recently, Intel partnered with Cornell University to use A.I. to build chips that can smell and recognise dangerous chemicals in the air³.

Scent synthesizers

Scent synthesizers are computer peripheral devices that emit a scent when the user, for example, visits a particular website or opens an email. The aim is to provide multi-media experience in the entertainment and e-commerce industry.

What's next?

In terms of type, the e-nose is expected to hold a substantial larger share of the market compared to the scent synthesizer as its utilisation in healthcare, military & defence, and food & beverages are considered to be high value markets. However, with the covid-19 pandemic causing sudden and rapid change in our habits and lifestyles, there may be a renewed interest in the scent synthesizers, especially in the field for gaming enterprise and online innovative marketing.

Publication Highlights

Gomes, N., Silva, F. & Semin, G. R. (2020). The Lasting Smell of Emotions: The Effects of Reutilizing Fear Sweat Samples, *Behavior Research Methods*, <https://doi.org/10.3758/s13428-020-01412-5>

Silva, F., Gomes, N., Korb, S. & Semin, G. R. (2020). Investigating the contribution of chemosignals to the awareness thresholds of emotional stimuli. *Chemical Senses*, doi:10.1093/chemse/bjaa047



³ https://www.digitaltrends.com/computing/intel-loihi-neuromorphic-chip/?utm_source=sendgrid&utm_medium=email&utm_campaign=daily-brief