

# With a whiff, 'e-nose' can sense fine whiskey

April 6 2022

---



Credit: Pixabay/CC0 Public Domain

Scotch or Irish, single malt or blended? While a whiskey enthusiast might be able to distinguish the good stuff from run-of-the-mill by smell alone, most tippers rely on the label, black or otherwise.

Whiskey is one of the most popular alcoholic beverages worldwide, and

with some high-end brands fetching five or six figures, it's also a favorite target for fraud.

To combat this, researchers have developed an [electronic nose](#) (e-nose) that can distinguish among different brands, origins, and styles by "sniffing" the liquor.

The project was led by Associate Professor Steven Su with PhD students Wentian Zhang and Taoping Liu from the University of Technology Sydney (UTS), in collaboration with chemists Professor Shari Forbes and Dr Maiken Ueland.

"Up until now, detecting the differences between whiskies has required either a trained whiskey connoisseur, who might still get it wrong, or complex and time-consuming chemical analysis by scientists in a lab," said Associate Professor Su.

"So to have a rapid, easy to use, real-time assessment of whiskey to identify the quality, and uncover any adulteration or fraud, could be very beneficial for both high-end wholesalers and purchasers," he said.



The e-nose was tested and displayed at the CEBIT Australia tradeshow. Image: UTS

The team used a new e-nose prototype (called NOS.E), developed at UTS, to identify the differences among six whiskies by their brand names, regions, and styles in less than four minutes.

The experiment used samples of three blended malts and three single malt whiskeys, including Johnnie Walker red and black label whiskey, Ardbeg, Chivas Regal and a Macallan's 12-year-old whiskey.

The study, recently published in the *IEEE Sensors Journal*, showed the e-nose reached 100% accuracy for detecting the region, 96.15% accuracy for brand name and 92.31% accuracy for style.

NOS.E is designed to mimic the human olfactory system, using eight [gas](#)

[sensors](#) to detect odors in a vial of whiskey. The sensor array generates the unique signal matrix according to the different [odor molecules](#) it comes into contact with.

It then sends the data to a computer for analysis, with a [machine learning algorithm](#) trained to recognize whiskey characteristics.

The researchers confirmed the NOS.E findings using state-of-the-art lab tests on the whiskey samples: time-of-flight [mass spectrometry](#) paired with two-dimensional [gas chromatography](#), which yielded similar results.

The technology has applications not only in the alcohol industry, with beverages such as wine and cognac as well as [whiskey](#), but also for other products that are subject to counterfeiting, such as high-end perfume.

The e-nose technology has also been used to detect illegal animal parts sold on the black market, such as black rhino horns, and has great potential for health applications and disease detection.

**More information:** Wentian Zhang et al, The Use of Electronic Nose for the Classification of Blended and Single Malt Scotch Whisky, *IEEE Sensors Journal* (2022). [DOI: 10.1109/JSEN.2022.3147185](https://doi.org/10.1109/JSEN.2022.3147185)

Provided by University of Technology, Sydney

Citation: With a whiff, 'e-nose' can sense fine whiskey (2022, April 6) retrieved 27 April 2024 from <https://techxplore.com/news/2022-04-whiff-e-nose-fine-whiskey.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.