

20-component Olfactory Display Development

Yosuke Onda, Kazuki Sato

R&D Center, TAIYO YUDEN CO., LTD, Gunma, Japan

onda@jty.yuden.co.jp

An olfactory display is a device that generates a wide variety of odors on demand. Our olfactory display consists of an electro-osmotic (EO) pump, a micro-dispenser, a surface acoustic wave (SAW) atomizer, and a ventilation fan. The EO pump and micro-dispenser mix 20 odor liquid according to predefined recipes generated from AI-based models, mass spectrometry data, and other sources. The mixed odor liquid is then dispensed onto the surface of the SAW atomizer. The SAW atomizer converts the liquid mixture into an odorized vapor, which is delivered to users by the ventilation fan.[1] Figure 1 shows a schematic diagram of the olfactory display.

Our previous olfactory display had several technical issues, including its relatively large size and occasional dispensing failures. To solve these issues, we improved the connection between the EO pump and the micro-dispenser and developed a new control circuit board for the EO pump. The EO pump and micro-dispenser are vertically aligned and connected by a threaded tube, which reduces dispensing failures and liquid leakage. The EO pump requires voltage control in the range of 0 to 100 V. Previously, this control was achieved using a commercially available DAC board. To further miniaturize the control system, we developed a new control board based on pulse-width modulation (PWM).

At the workshop, we will demonstrate odor generation using the newly developed olfactory display (shown in Figure2.).

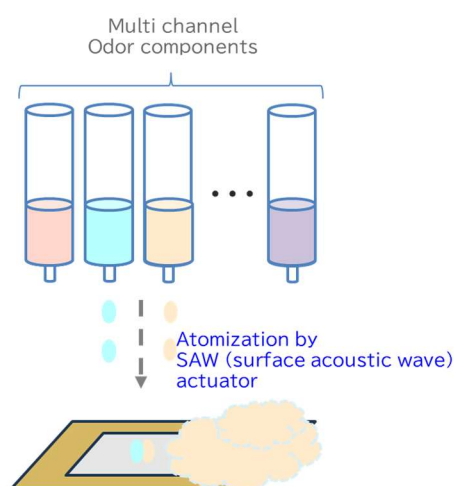


Figure1. Schematic diagram of olfactory display

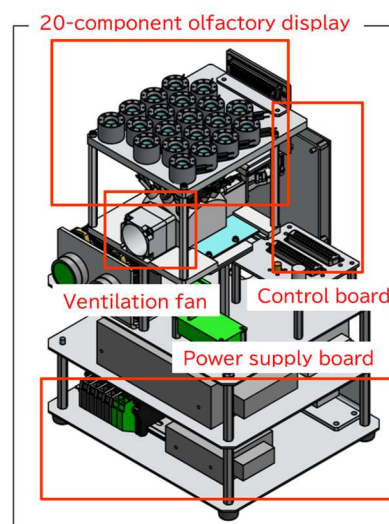


Figure2. New olfactory display (3D -CAD)

References

- [1] Iseki M, et al., Electr Eng Jpn. 2022