Scent-based Rapid Screening

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Scent-based Rapid Screening

ABSTRACT

Many businesses engage in temperature monitoring, e.g., by the use of handheld IR thermometers or IR cameras, to ensure that a visitor to the business is not running a temperature which is a sign of the visitor being a potential carrier of an infectious disease such as COVID-19. However, such detection methods are imprecise and not particularly effective if the visitor is an asymptomatic person. This disclosure describes the use of scented strips to determine if a visitor may be infected. Visitors are requested to identify the smell of a strip dispensed by an automated dispenser machine or by a human operator. Correct identification of smell serves as an indicator that the visitor is not likely infected with COVID-19.

KEYWORDS

- Anosmia
- Smell blindness
- Loss of smell
- COVID-19
- Smell test
- Odor test
- Scent-based screening
- Infrared (IR) temperature sensor
- Infectious disease

BACKGROUND

The advent of infectious diseases such as COVID-19 has necessitated that rapid monitoring methods be deployed to control and reduce the spread. Many businesses engage in temperature monitoring, e.g., by the use of handheld infrared (IR) thermometers or IR cameras, to ensure that the visitor is not running a temperature which is a sign of the visitor being a potential carrier. However, such detection methods are imprecise since they depend on the
quality of the handheld IR camera as well as the correct procedures being followed. Further, this method is not particularly effective if the visitor is an asymptomatic person. Additional screening methods to determine whether a visitor is a potentially infected can be useful.

**DESCRIPTION**

Many illnesses, including COVID-19, are known to cause a loss of or a substantial decline in the sense of smell. The techniques of disclosure make advantageous use this effect to screen visitors.

![Diagram](https://www.tdcommons.org/dpubs_series/3734)

**Figure 1: Testing visitors for sense of smell**

Figure 1 illustrates testing visitors that are visiting a business, e.g., in the building lobby or other suitable place, to determine whether their sense of smell is intact. When a visitor enters
the lobby, a randomly selected scented strip is provided to the visitor. As shown in Fig. 1, the scented strip can be provided by an automated dispenser machine or by a human operator.

As shown in Figure 1, the automated dispenser machine (or operator) randomly selects and dispenses a strip from available strips of different smells. In the example of Figure 1(a), three different types of strips - banana, apple, and orange - smells are shown. The strips are visually identical. The strips can be calibrated such that the emitted odor is within a normal range that can be detected by humans.

The visitor is requested to take a strip and indicate the smell of the strip, e.g., via a user interface as shown in Figure 1(a) (or via audio or other suitable mechanism), or by the human operator. The visitor’s response is received. For example, as shown in Figure 1(a), the visitor may provide a spoken response (“Banana!”). Alternatively, or in addition, the visitor can provide the response via another touchless mechanism, e.g., via a gesture that selects banana from a displayed user interface (not shown).

The visitor’s response is evaluated by comparing with the groundtruth strip that was dispensed. The test can be repeated multiple times if necessary. The test as described herein can be combined with other tests and rules, e.g., temperature monitoring, confirming that the visitor is wearing a mask, etc. If the visitor passes the test, the business can permit the visitor entry, e.g., by the machine or the human operator opening the door, as shown in Figure 1(b).

The described techniques can serve as a low cost, rapid screening mechanism to more accurately identify visitors that may pose a risk in terms of being disease carriers. The techniques can be implemented via automated machines or can be implemented manually by a human operator. With appropriate selection of scented strips and evaluation of visitor responses, the described techniques can be used in combination with other techniques such as temperature
monitoring and can help further reduce risk posed by visitors to a business and therefore, slow down the spread of disease.

CONCLUSION

Many businesses engage in temperature monitoring, e.g., by the use of handheld IR thermometers or IR cameras, to ensure that a visitor to the business is not running a temperature which is a sign of the visitor being a potential carrier of an infectious disease such as COVID-19. However, such detection methods are imprecise and not particularly effective if the visitor is an asymptomatic person. This disclosure describes the use of scented strips to determine if a visitor may be infected. Visitors are requested to identify the smell of a strip dispensed by an automated dispenser machine or by a human operator. Correct identification of smell serves as an indicator that the visitor is not likely infected with COVID-19.