

# SpotScents

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## 1 Introduction

SpotScents generates limited regions, or “spots,” of scents in a free space. This is very different from conventional ways of enjoying scents, such as filling an entire room with aroma by using an aroma pot.

The goals of this project are to control 3D olfactory space and to incorporate the olfactory channel in virtual reality applications and other audio-visual media, including movies and games. We would like to achieve a natural experience in an unencumbering way in order to make scent a commonly used component of digital media.

So far, the major problem with emitting scents has been that odor diffuses to a wide area and it cannot be dissipated in a short time. To overcome this problem, we have proposed a method to deliver scents to a limited region. The core technology of this project is the use of scent projectors. Scent projectors enable localized scent to be delivered to a human’s nose through free space. People do not need to wear any special devices or trailing tubes.

## 2 Technology

A scent projector (Figure 1) is composed of an air cannon mounted on a pan-tilt platform. The air cannon launches vortex rings that can travel several meters. The travel distance depends on the design parameters of the air cannon, such as aperture size. MicroScents also worked with the idea of using air cannons to launch scented air [Watkins 2002], but they simply filled the chamber of an air cannon with scented air, and thus they cannot launch different kinds of smells within a short time. Our scent projector has a unique mechanism that can emit different kinds of smell in each shot [Yanagida et al. 2004]. Because scent projectors emit only a small amount of scented air, we do not need to provide air conditioning equipment in order to provide different scents within a short time frame.

One problem with our original scent projector was that the user could feel a significant wind force when the vortex ring hit his or her face. Here, we propose a novel method to allow scented air carried from a nearby place to stay a while at a certain location without the unnatural feeling of sudden air current. This was achieved by intentionally breaking the vortex rings, that is, launching multiple vortex rings and letting them collide at the target point (Figure 2).

## 3 Applications

Technologies to control olfactory space will enable people to enjoy scents as media in their daily life. SpotScents could be used at home, shops, and public areas without requiring special air-conditioning facilities or forcing users to wear any special devices. For example, at home people can enjoy movies and interactive games that feature rapid smell switching that corresponds to

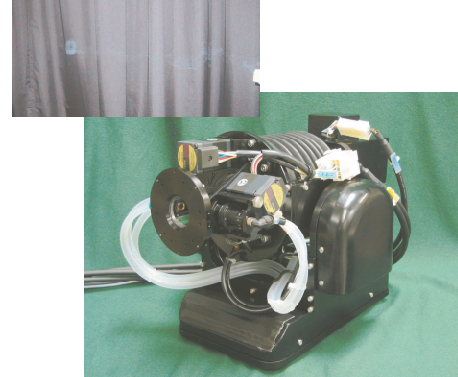


Figure 1: Scent projector and a vortex ring.

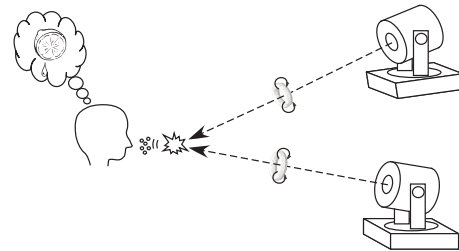


Figure 2: Making spot of scents.

changes in scenes. For TV broadcasting, advertisers can provide a series of short “scented” commercial messages (perhaps 15 seconds). For example, a perfume commercial could follow a coffee commercial. In retail commerce, businesses could use suggestive smells to make people notice shops as they walk through shopping malls.

## 4 Conclusion

We expect scents to be commonly used as media of digital art and technology. In the next step, we would like to closely combine the olfactory experience with the audio-visual experience, to let the user feel the air of “the world beyond the screen.”

## Acknowledement

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