

## Digital Scent Technology

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**Abstract**— The technology has so far targeted mainly our sense of sight and sound. To further enhance the virtual reality experience technology is now targeting nose and tongue. What if you could send the smell of amazing curry with the picture? What if you can watch cooking shows with amazing smell fills the air around you. The three quarters of our emotions are affected by smell approximately. That means smell plays a very crucial role in our daily life. The question arises, is it really possible to send and trade smells electronically? Yes, with the help of Digital Scent Technology, you will be able to send and receive the scent, like smell the perfume before buying it online, smell the food to check it is fresh or not, and many more.

**Key words:** Olfaction, Digiscents, iSmell

### I. INTRODUCTION

The sense of smell, olfaction, is the capacity to discover the presence of odorous substance in the air. Human can detect 10,000 to 100000 odorants. There are different synonyms of smells for example, odour is use to describe unpleasant smell, aroma is use to describe strong pleasant smell, fragrance are sweet such as perfume.

In this modern era, computer plays an important role in our life. Today computer have virtually taken over in every field. It provides very good features. Virtual Reality making human computer interface effective. Now days virtual reality can be experienced through sight and sound.

To experience virtual reality further, technology is now targeting on nose. Just imagine isn't it would be wonderful if we can experience the smell before buying it online. With the help of digital scent technology it is possible to smell through internet.

DigiScents combines the power of science combines the fact that the sense of smell is powerful and emotional trigger as any other sense, the websites states.

The digital smell is combination of hardware and software. Hardware will produce the smell and software will evaluate smell and generate specific signal for smell and finally it will be produce be device. The hardware device is like a speaker it is connected to the computer.

Digital scent technology brings its vast area of applications in scent-entertainment, games, movies and music, in communication which includes websites which is improved with scent. It is also useful to E-commerce which will make online shopping interesting and fun. In the new future you will be able to not only just see but also to smell things on the internet or other application. It is also helps in advertising field making it more attractive and memorable. Many companies working in digital scent technology are developing new technologies for identifying brain disorders like Alzheimer's, Parkinson's. This method is based on detecting the olfactory deficits that are diagnostic of dominating diseases.

#### A. Evolution of Digital Smell:

The idea is invented by experts in Bioinformatics and genomics Dexter Smith and Joel Lloyd Bellensons. They

started following the idea if we can find essence of biological smell we can digitized and broadcast it.

In 1960 film 'Scent of Mystery', the idea made its first appearance which timed odours to specific points in the narrative. The film opened in three equipped theatres in New York City, Los Angeles, and Chicago. It did not work properly and audience complained of noise with the scents as well as a delay between the smells and actions. As a result, even after the mechanism was fixed the film failed miserably.

There are documented cases of scents being used in films over 100 years ago. Cotton was soaked in rose oil, and then placed in front of a fan in order to whirl the scent around. A bit of cotton soaked in one specific oil can't change scents based on what is happening on-screen. Fortunately, this is easy to overcome. A typical smell-o-vision machine is like a fan with a box of various scented oils. The box receives the signals and tells to release particular scents and if you don't have exact smell you want, you can mix some of it which are available So, you will get desired result.



Fig. 1:

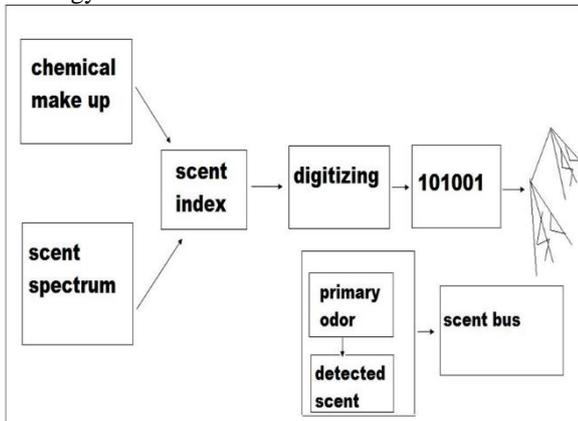
The brains of —smell-o-vision— Michael Todd Jr. (left) sits beside master control and scent energizer of the Smell-o-vision system with its inventor Hans Lube. Latter points to the multitude of vials each containing a different scent which is selectively projected through tubes to every seat in theatre on signal triggered from picture's sound track.

Two centuries later, however, in the 1970s, odour-preservation technique is developed by the Swiss fragrance chemist Roman Kaiser. He dubbed headspace capture analysed process and manufacturer the fragrances of the natural world. Kaiser used his technique to measure and recreates the scents of a tropical rainforest. In the 1980s, the scent scientist BrajaMookherjee, invented a process that allowed technicians to extract fragrant molecules from living flowers for recreating their smells. In the late 1990s, Japanese scientists began developing an "odour recorder" that promised to replicate and capture the scents.

Today, the odour artist SisselTolas uses headspace technology to create "scratch and sniff" maps of the world. Olivia Alice uses a similar technique to preserve the scents of loved ones that linger on their clothes — by "deconstructing the clothing and extracting its composite and essential elements.

## II. METHODOLOGY

Scent is detected by the electronic nose which is also act as the receiver. There is a scent spectrum and indexed smell is primary smell which produces smell in the scent spectrum. Following is the communication model of Digital Scent Technology-



As shown in above diagram of communication model of Digital Scent Technology, with the help of chemical makeup and its position in scent spectrum, e-nose detects the lots of smells. Scent is indexed according to its chemical makeup and scent spectrum. Then each indexed smell is coded and digitized into small files. This digitized smell is encoded with the email to the recipients computer. At the other end user will open the mail by clicking on it. It will recreate the small amount of aroma which is inhaled by users nose. The smell is emitted with the form of vapors.

## III. HARDWARE DEVICES:

### A. Smell Synthesizer

The device which generates smell is called smell synthesizer. Different types of smell synthesizers are available in market but for this it is made by company name Digiscents.

### B. iSmell:

Digiscents company suggests ismell. iSmell synthesizer is attached to computer and offers diffrenet smells. ScentStream is driver which is connected to personal computer throught USB. It turns smells into digital codes that can be stored on laser discs or as computer files. It is able to produce 10,000 smells.



Fig. 3.2.1: Digiscents ismell version 1



Fig. 3.2.2: Digiscents ismell version 2

### C. Cartridge:

Cartridge stores either natural oils or man-made oils that will be energize by one of the air or heat up pressure, when a signal is send by computer. It contain pallet of 128 chemicals. The strength of the scent can be adjusted. Cartridge is an “odors printer”, because you can refill it or purchase it .With the combination of 128 chemicals you can produce 10,000 smells.

## IV. EXISTING SYSTEM

### A. Smelling Screen:

A team of Tokyo University in japan have invented smelling screen that makes smells from the spot on a display that the corresponding objects appear. It is created by Haruka Matsukura and a team of colleagues.



Smelling Screen

### B. Disadvantage:

Currently it can produce only one smell at a time.

## V. PROPOSED SYSTEM

To overcome the disadvantages of smelling screen, cartridge will be used as per the researcher. Unfortunately the cartridge need to change periodically and can only carry a small amount of ink. So after a while the ink inside cartridge will run out quickly. What can we do to increase the capacity of cartridges? Making the cartridge bigger won't work because it won't be portable so good thing is adding a CISS(Continuous Ink Supply System) like we have printer CISS. When we use CISS we actually extend the cartridge using a tube or hose and attach it to an external link tank,

pretty much like water tank attached by water pipes. Now in this case the cartridge will eject ink from the tank the ink in the tank is equivalent to 40 cartridges. So when the ink in the tank becomes low all you have you have to do is fill the tank as u fill the water in water tank.

[7] <https://www.choice.com.au/electronics-and-technology/computers/scanners-and-printers/articles/com>

## VI. FUTURE WORK

Digital Scent Technology is not very popular and also need to research a lot. For future we need to focus on the below area more.

### A. Over the Internet:

The user to fill more realistic effects of products they are buying digital scent technology can be used.

### B. Over the Television:

These days as new and new sound technology came in picture our home television is changing, getting more and more powerful sound with it. After some time over television will come will more clear picture, better voice as well as smelling screen, which will create more interest in watching the television.

#### 1) Education:

The addition of scent to the classroom experience will be interesting. The Smell is acknowledge as a tool that enhances the memory of that experiences and amount of knowledge that is retained.

## VII. CONCLUSION

There is a great potential for the use of smell in Human Computer Interaction and also as output medium. The problem in this technology is the complexity of smells, difficulty of managing timing and intensity, the unpredictability of air flows. odors might be pleasant but it combined it can nasty. On the positive side, smell could improve virtual experiences such as online film and computer games. It capture the attention of audiences better and affects learning, mood and memory. So Scent technology could help users to maintain a more calm and great mood. This technology could enhance advertisement. It is a great tool for marketing. The olfactory nerve is close to the areas of the brain both for the memories and emotions that's make it very powerful target for advertise. Digital Scent Technology could be useful for visually or hearing imperfect people who will find this technology useful in use of computer.

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