

**A**  
**Seminar**  
**Report on**  
**Digital Scent Technology**

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## **Abstract**

The technology has so far targeted mainly our sense of sound and sight. To further enhance the virtual reality experience and another flavour to it, technology is now targeting our tongue and nose. The application area of virtual reality is vast- from normal entertainment to the Internet and e-commerce application. We will be able to smell product before buying them online.

The technology has targeted only on our sense of sight and sound so far. This is the reason why we have realistic looking games, and graphics card. What if we could send the smell of spice and flowers with pictures? Now with the digital scent technology we are able to sense, transmit and receive the smell through internet in which a perfume can smelled online before buying them, freshness of a food which are ordered through online can be checked, can smell burning rubber in our favourite racing game or send scented e-cards from scent enable websites. As this technology gains extensive assert, there is nothing stopping it from entering into all areas of virtual world.

Envisage being able to smell things using a device connected to our computer. Digital scent technologies are making this a reality. This paper presents a detailed analysis on broadcasting of smell, hardware devices and applications of digital smell technology

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## **Introduction**

In this modern age, computers have verified the cause of their existence. They have virtually taken over in every field of today's fast life. Gone are the days when application of computers were limited to official use only. Today computer have important place in every household purpose, and mainly internet has taken over whole world.

There are various causes due to which computers have their own stand in our life. It provides a very good facility of fast processing, picture and sound. This virtual reality concept has provided very good features to the computer systems, and it is introduced by the computer programmers to provide more attachments to the user. There are several concepts of the virtual reality that are available such as digital scent, virtual theatre, electronics hand gloves, multipoint 3d goggles, surround sound system.

The digital smell is basically a hardware software combination. The software part of digital scent will evaluate the smell equation and generate specific signals for specific smell, and the hardware part of digital smell will produce the smell will produce the smell.

Smell has a strong power over human beings. The sense of smell is intimately linked to the memory and emotions making scent a powerful way to boost ideas. It wins the attention of audiences and affects learning, mood and memory. This technology could upgrade advertisements and is a great tool for marketing. It can be used in several streams such as over the television, theatre and the web.

Multisensory experiences attract the attention of audience and olfactory stimulus perfectly accomplishes learning, mood and memory so this technology could help users to maintain calm and superb mood in education. This technology also stepped its foot in the medical field for diagnosing many diseases, This will become our need in future.

## **Literature Review**

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## **What Is Digital Scent Technology?**

Transferring smell over an internet is still not very popular. New technology is being developed to root around our sense of smell. Digital smell is one of the concepts of virtual reality.

The virtual reality has provided very good features to the computer systems. The digital smell is generally a hardware software combination. The role of hardware is to produce the smell and the software part will evaluate the smell equation and generate distinct signals for distinct smell and lastly the device will produce that smell. With the digital scent technology one can sense, transmit, reproduce and recapture smell, flavours and fragrances digitally through the internet and smell things using a USB powered device that is supposed to emit appropriate smell at exact time. California-based Digi scents Inc. has developed the I Smell personal scent synthesizer.

This small device is connected through our PC via serial port and has its own driver. An interactive media company known as Digi scents is developing I Smell Digital Scent Technology, new software which will permit scent to be broadcast from the Web. Another developer of smell based computer interface device, Aroma-Jet is announced in 2001, had successfully imparted scent over the Internet. Later, they continued to market it as an entertainment technology as well as for medical use. Digital scent technology could appreciate advertisement and swing consumer emotions towards a brand. The olfactory nerve is close to the areas of the brain that make it very powerful target for advertise. The potential of marketing would be huge by using scent in advertising.

Regardless of the business, digital scent technology could help its users in an effective and intellectual way by intensifying the health and emotional happiness of its users. This technology aids to design characters and to give an emotional intelligence of existence. This amazing technology provides huge area of applications in communication which includes websites with scent, in scent-entertainment, games, movies and music. It is also relevant to E-commerce which makes online shopping fascinating and fun. In the new future, one cannot only just see but also can smell things on the internet.

## **Why Is Digital Scent Technology?**

**Digital scent technology or olfactory technology** is the engineering discipline dealing with olfactory representation. It is a technology to sense, transmit and receive scent-enabled digital media (such as web pages, video games, movies and music).

## **Where Is Digital Scent Technology used?**

- ❖ Web Page
- ❖ Movies
- ❖ Music

## **Role of Digital Scent Technology**

This technology plays its important role in the following fields.

### **❖ Medical:**

Aromatherapy is a kind of curing certain disease by using different types of smell. It helps in discriminating brain disorders.

### **❖ Education:**

Scent is an effective teaching tool for subjects such as Geography, History and Science.

### **❖ E-Commerce:**

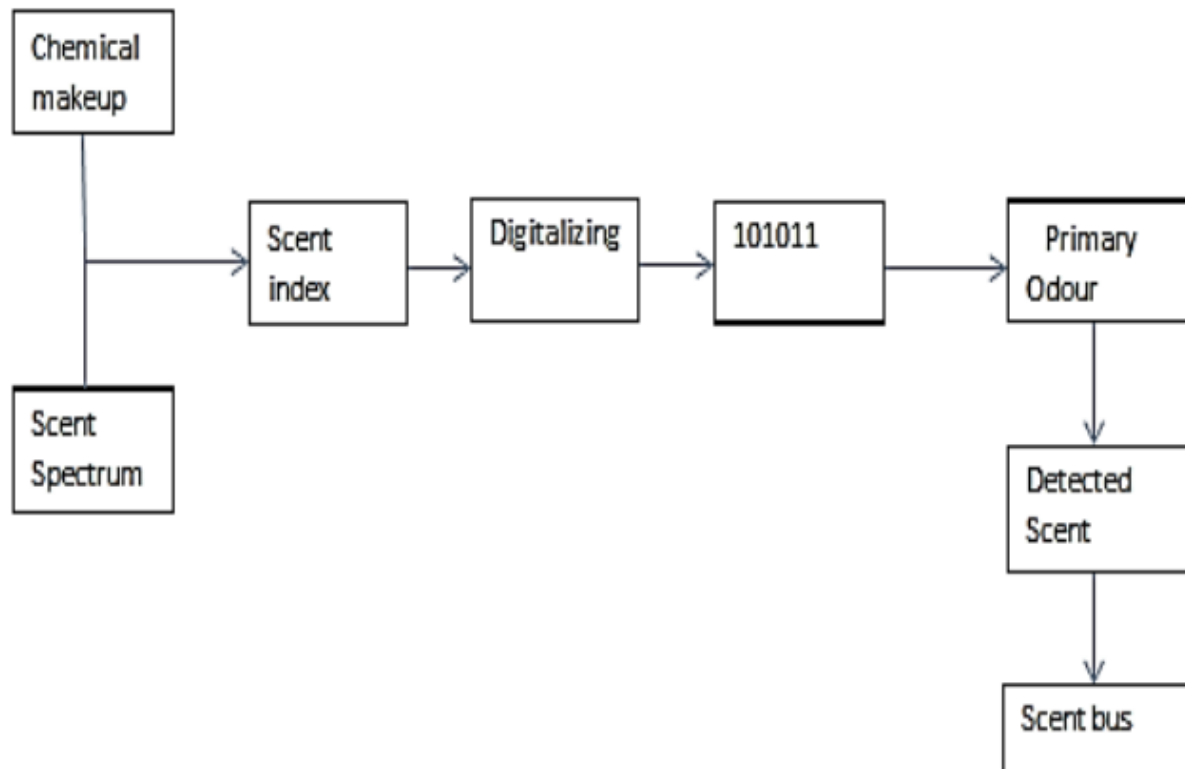
This technology provides live shopping experiences. This enables to buy perfumes, flowers and food beverages from exotic places.



## Methodology

This technology works in combination with Olfactometer and Electronic nose. An olfactometer is an instrument that is used to detect and measure odour dilution. They are used to gauge the odour detection threshold of substances. Olfactometers introduce an odorous gas to measure intensity, as a baseline against which other odours are compared.

An electronic nose (e-nose) is a device that recognizes the specific components of an odour and for this reorganization the device analyses the chemical makeup of tat components. It consists of two mechanisms which are chemical detection and pattern recognition.



**Fig1. Transmission Model of Digital Scent Technology**

Scent is detected by the electronic nose which acts as a receiver. Like the colour spectrum, there is also scent spectrum and any smell will be the indexed smell of primary smells in the scent spectrum.

In favor of the chemical Makeup and its position in the scent spectrum, e-nose detects thousand varieties of smell.

The scent is indexed based on its chemical makeup and scent spectrum. Then by olfactory signal processing each indexed scent is coded and digitized into a small file.

This digital file is enclosed with a World Wide Web content or email to the recipient's computer. At the receiving end, when the user activates the file by opening it, the personal scent synthesizer will recreate the smell of aroma and the air cannon will direct the smell into the user's nose. The digitally encoded file which is transmitted contain the data about the smell. The smell emitted will be in the form of vapor.

## **Hardware devices**



**Fig2.Digital smell recorder**

Both the software and hardware are created by synthesizers in which the game producers need to mix and incorporate scents into their latest offerings. Reminiscent is a database of standard smells. These odors will be licensed to developers for integrating it into games, websites, and advertisements and so on.

## **Devices that are used in transferring smell over internet**

### **Smell Synthesizer:**

Scent synthesizers are devices which are used to generate the smell in accordance with the file which is digitalized during the transmission of that smell through the web. They are interfaced with the personal computer through an USB port and then they are programmed to generate a small quantity of smell vapours into the surrounding. Smell synthesizers are available with wide varieties in the market but for personal computers they are made by Digiscents industry.

### **iSmell:**

The iSmell Personal Scent Synthesizer is a small device and using an USB port it is connected to a computer. This device is powered using any ordinary electrical outlet. This device is developed by Digiscents Inc. The device appearance looks similar to that of a shark's fin, with many holes lining up in the fin like structure to release the various scents. It is activated by a driver program called as Scent Stream. Using a cartridge which is similar to a printer, iSmell synthesizes and even create new smells by mixing certain combinations of other scents. These newly created odours resemble common natural and manmade odours. The cartridge used has to be swapped once the scents inside are used up. When these scents are incorporated with websites and interactive media, they can be used automatically once a website is opened or can be activated manually.



**Fig3a. Digiscents iSmell version I Fig3b. Digiscents iSmell version II**

**Cartridge:**

Cartridge contains chemicals such as natural oils or synthetic fragrances and these chemicals are activated by either heat or air pressure, when the signals are sent from the computer. Presently, a cartridge is stored with 128 chemicals which are able to produce 10,000 different types of smell.

These chemicals are activated electrically in different combinations to produce specific smell in response to software prompts and are programmed into applications such as Web site features, computer games, digital music and movies. Similar to an ink jet printer, these chemicals form the core of a replaceable cartridge, which is inserted into the iSmell device. The scientists are still investigating different scent combinations which are possible with the iSmell device. As the technology becomes more cultured in future, a large number of scent combinations will be possible.



**Fig4: Cartridge**

The idea is to have a box about the size of a small speaker that would be connected to personal computers and within that box is a cartridge of odours, having hundred different small chambers in it. Then by depending on the commands from the computer, various odours within that hundred is chosen, mixed up together and are gently puffed out of this port.

**Scentography:**

Scentography is a device that permits incorporation of scents with traditional digital multimedia such as games, DVDs and web sites. The capability to digitize and broadcast scents will enable the dealers and consumers to send scented mail, make and watch scented DVDs, and play scented games.



**Fig5: Scentography**

## **Advantage and Disadvantage of Digital Scent Technology**

### **Advantages:**

This technology can be used without cascade of hours, days, weeks and even months and can even mislead problems combined with the use of human panels such as individual variability, adoption, burnout mental state and liability to unpredictable material.

- ✓ The iSmell is a condensed device and so it is easily carriageable and lightweight.
- ✓ iSmell can distinguish simple molecules which cannot be consummate by human nose.
- ✓ The cartridge store mainly natural materials.

- Online Movies,
- 4D cinema,
- Online shopping,
- Automated Aromatherapy,
- Smell emitting T.V and Mobile Phones,
- Play online smelling video games,
- Watch fragranced DVD's,
- Send perfumed email,
- Release food scents,
- Smell a perfume before buying them online,
- Smell the collection of just produced boiled coffees for business in their online store.

### **Disadvantages:**

- The price is one of the explicit. Why home computer users would be in favor to pay the \$250500+ price for the device that stinks. Some fanatic game fans may find this technology to boost their interactive media experience, but chances of this technology will acquisition in small booth and other specialty shops.
- How do you ensure that the odor is systematically spread across the room or persons in a significant amount so as to be noticed by all the viewers at the same time?
- The digital scent technology is even now under grown, and will need a dedicated partners and moderate venture, to transform the results so that smell branding companies can assurance and faith them.
- Difficult to create olfactory process because of a set of primary odors has not been originated really.
- The sense of smell is not well understood compare to the other senses.
- Smells are not orthogonal.



## **Applications**

- To send scented email
- To watch scented DVD's
- To Play Scented video games
- To sample a perfume from a beauty product's website
- To smell the assortment of freshly brewed coffees for sale in their online store

## **The Future scope of Digital Scents**

- ❖ Under their system a person could send an 'encoded' message from one computer to another, and then person will get the message in the form of smell.
- ❖ Then this smell will be cached by the input ismell device then given to the translator which will translate these release chemicals to the message form.
- ❖ In future, the scent technology can be introduced using 3 dimensional projections which enable people to view more realistic views. People can conduct meetings at different places during the same interval of time. The online classes can also be conducted by the schools and colleges during the rainy seasons.
- ❖ Google Nose: New and existing technologies purportedly employed by Google Nose promised to provide smartphone and other users of handheld devices the ability to search for, and actually smell, a wide variety of fragrances.

## **Conclusion**

Smell has a strong power over human beings. The sense of smell is intimately linked to the memory and emotions making scent a powerful way to boost ideas. It wins the attention of audiences and affects learning, mood and memory.

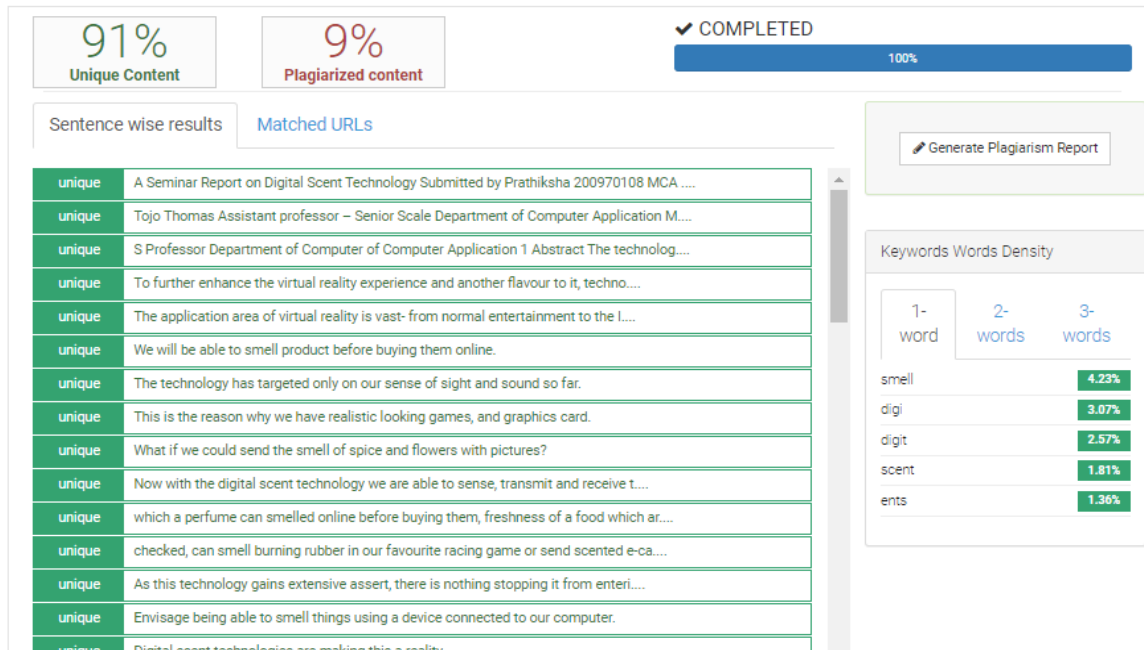
This technology could upgrade advertisements and is a great tool for marketing. It can stimulate emotions such as fear or love. This digital smell can be used in several streams such as over the television, theatre and the web.

Multisensory experiences attract the attention of audience and olfactory stimulus perfectly accomplishes learning, mood and memory so this technology could help users to maintain calm and superb mood in education. This technology also stepped its foot in the medical field for diagnosing many diseases. This will become our need in future.

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