

# Digital Scent - An Unnoticed Technology

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## Abstract:

Innovation has till date targeted mainly our sense of sight and sound. This is the reason why we have realistic looking games, and graphics card that are fit for rendering them. What if you could send the smell of amazing food dishes with the picture? Yes, with the help of Digital Scent Technology we are able to sense, transmit and receive the smell through internet. Technology is now focusing on your nose. The three quarters of our emotions are affected by smell approximately. Smell seems to be an unrecognized medium and a new channel in multimedia. Digital scent technologies are making this a reality. This paper presents various dimensions about broadcasting of smell, hardware devices and focuses on ongoing research and future challenges in digitizing smell and its transmission over internet.

*Keywords* —digital scent technology, iSmell, broadcasting of smell.

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## I. INTRODUCTION

The sense of smell, the capacity to discover the presence of odorous substance in the air is called as olfaction. An average human can detect between 10,000 to 1,00,000 odorants. In this modern era, computer and mobile phones plays an important role in our day-to-day life. Today computer and mobile phones have virtually taken over in every field. Now days virtual reality can be experienced through sight and sound in virtual games, 3D sound and movies . 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 of perfume or food items before buying it online. With the help of digital scent technology it is possible to smell through internet.

### What is digital scent technology?

Till present we only know three of our senses - hearing, touch and sight . All this three are implicated in online communication. Digital smell is one of the concepts of virtual reality. The digital

smell is generally a mixture of hardware and software . The role of hardware is to produce different types of smell and the software part will evaluate the smell equation and generate distinct and different signals for distinct smell and lastly the device will produce that smell.

With the help of digital scent technology we would be able to digitally transmit, reproduce ,sense and recapture smells, different flavors and fragrances through the internet. Digital scent technology helps to create characters and gives an emotional intelligence of reality. Digital scent technology would be used for its broad area of applications in games, movies, scent-entertainment, cooking shows and music, in communication and television medium which includes internet can be improved with scent. The digital scent technology is fundamentally an programming mix. The equipment part of advanced notice will deliver the odor, and the product part will assess the odor condition and create particular signs for particular smell lastly that notice will be created by the gadget. The equipment gadget is a

gadget like speaker, as speaker this gadget is likewise associated with the PC framework. For this gadget there is likewise a driver program which will assess the computerized condition for producing particular gas. As of recently, online correspondence included just three of our faculties hearing, touch, and sight. New innovation is being produced to speak to our feeling of smell. DigiScents, an intuitive media organization, is making iSmell Digital Scent Innovation, new programming which will empower aromas to be communicated from the Web.

**II. METHODOLOGY**

This technology works in combination with Olfactometer and Electronic nose(e-nose). The instrument used to detect and measure odour dilution is called as olfactometer . This instrument is used to gauge the odour detection threshold of substances. Olfactometer introduce an odorous gas to measure intensity, as a baseline against which other odours are compared. Electronic nose (e-nose) is a device which is used to recognizes the specific components of an odour. Scent is detected by the electronic nose, which otherwise act as the receiver. Like the color spectrum, there is also scent spectrum and any smell will be the indexed smell of primary smells in the scent spectrum.

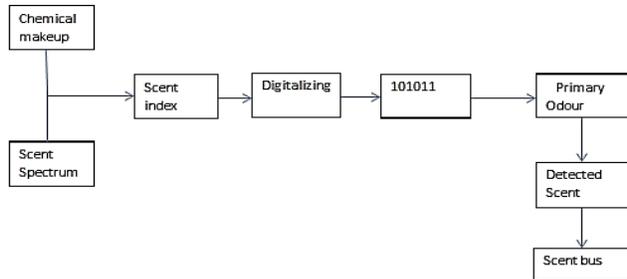


Fig: 1 Communication Model of Digital Scent Technology

As fig.1 shows the communication model of digital scent technology; with the help of these two parameters of smell; chemical Makeup and its position in the scent spectrum, e-nose detects the thousands of smells. Like the colour spectrum, there

is also scent spectrum and any smell will be the indexed. E-nose detects thousand varieties of smell. Then each indexed scent is coded and digitized into a small file by olfactory signal processing. This digital file is enclosed with 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 small 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.

**III. HARDWARE DEVICES**

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.

Below are the devices that are used in transferring smell over internet.

**A. 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. 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. The iSmell device reads a digital scent file, creates a smell from a "palette" of 128 chemicals stored in a cartridge, and then wafts into the air with a small fan. It is able to produce 10,000 smells. To active this device for computer it will require a driver program called as Scent Stream. This device is developed by Digiscents Inc.



Fig.2A1 : Digiscents ismell version 1

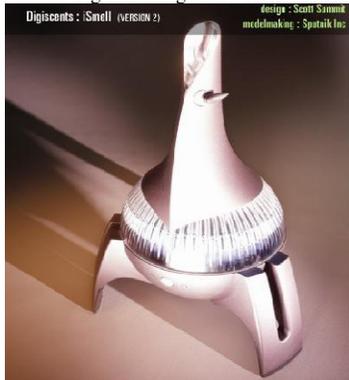


Fig.3A2 : Digiscents ismell version 2

**B. Cartridge**

The cartridge will contain chemicals - Either natural oils or manufactured/synthetic fragrance that will be energize by either warmth or gaseous tension, when the signals are sent from the computer. As of now 128 chemicals are put away in a cartridge. 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. 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.



Figure.4B1 Cartridge

As the innovation turns out to be more refined, an ever increasing number of aromas and fragrance mixes will be conceivable. "The thought is to have a case about the size of a small speaker that would be connected to personal computers and inside that case is this cartridge of scents, having a hundred diverse small chambers in it, then by depending on the commands from the computer, various odours within that hundred is chosen, mixed up together and afterward puffed delicately out of this port where you can notice it.

**C. Scentography**

Scentography is a device that permits incorporation of scents with traditional digital multimedia such as games, DVDs and web sites, for example, recreations, DVDs, and sites. By enabling you to speak with smells, Scentography includes another measurement and lavishness to site pages and for all intents and purposes some other type of electronic/advanced correspondence. The capacity to digitize and communicate aromas will empower merchants and buyers to send scented mail, build up notice 'n shop electronic stands, make and watch scented DVDs, and play scented amusement games.



Fig.5C1: Scentography

#### IV. BROADCASTING OF SMELL



Fig.6

It is carried out at the following 3 levels

1. Digitized Scent
2. Broadcast
3. Synthesize

**1. Digitized Scent:** A scent is indexed along two parameters, its chemical makeup and its place in the scent "spectrum" and then by olfactory signal processing each indexed scent is coded and digitized into a small file.

**2. Broadcast:** The digital file is sent, attached to enhanced web content

**3. Smell synthesize:** The smell synthesizer means the device which is used to generate the smells.

By activating the file automatically or manually, the personal scent synthesizer will recreate the smell of aroma and the air cannon will direct the smell into the user's nose. iSmell device transforms the smell into digital codes which are stored as computer files and are mailed. This device then reads the digital file, creates a smell from a palette of 128 chemicals stored in a cartridge, which drifts into the air with a small fan.

#### V. LIMITATION

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 considerable explicit of this technology is the price. As the technology is still not fully grown, the exact duplicates cannot be produced. The sense of smell is not well understood compare to the other

senses. The digital scent technology is even now under grown, this technology requires committed partners and dealer financiers to invest their money so that this could be revolutionary.

#### VI. APPLICATIONS

This technology plays its important role in the following fields.

1. **Medical:** Detecting heart diseases using electronic nose. Aromatherapy is a kind of curing certain disease by using different types of smell. It helps in discriminating brain disorders.
2. **E-Commerce:** This technology when implemented will provide us with benefits of live shopping experiences. This enables to smell a perfume before buying it, smell the collection of just produced boiled coffees for business in their online store, online movies, play online smelling game.
- 3 **Education:** Scent is an effective teaching tool for subjects such as Geography, History and Science. The Smell is acknowledged as a tool that enhances the memory of that experiences and amount of knowledge that is retained.

#### VII. FUTURE WORK

Fundamentally, we do not yet understand what the users expectations of smell as a medium will be. Some users may be temporarily or permanently, are unable to receive smell information – having a cold, or anosmia.

Furthermore, differentiating different smells can be hard: if two smells are already in a room, it's hard to determine the presence of the third or fourth. This technology is not very popular and will require a lot of research. The main focus of this technology will be in the below area more.

##### 1. Internet

With the addition of digital scent technology buyers will get more realistic effects of products they are buying.

##### 2. Television

These days home television are equipped with better quality sound system as well as with crystal clear picture quality. Both the sense are well

covered, but with the addition of smelling screen, we will create more interest in watching television.

### 3. *Education*

Addition of smell in education will enhance the memory and give a valuable experience to the learners and will help to increase the amount of knowledge. The addition of scent to the classroom experience will be interesting.

## VIII. CONCLUSIONS

Smell has a strong power over human beings. It can make a state of mind. It wins the attention of audiences and affects learning, mood and memory. It can strengthen feelings, for example, fear or love. Digital scent technology could enhance advertisement and swing consumer emotions towards a brand. This digital smell can be used in several streams such as over the television, theatre and the web. Multi-sensory experiences attract the attention of audience and perfectly accomplish 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. The future work includes the security over the system. Suppose in some scent transferred through internet encounter with have man in middle attack (means some terrorist mix some air virus), still the

more research is to be conducted to know its effect on human beings. This will become our need in future.

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