SMELLPUTER

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Abstract:
We are used to smell informing us about the state of things in our immediate vicinity; the aroma of the "Halwa" (An Indian Sweet), the Idli-Sambhar, the Pav-Bhaji or the smell of the perspiration of the people in the local trains of Mumbai. Emerging technologies will make possible computer-mediated scent. Computers will be able to control the output of smells as easily as they currently control video or audio. Computer control gives us the freedom to separate source from scent in an entirely new way. Scents can be used in a symbolic way, released as cues to signify an event or condition.

My work here explores the development of these smell icons, or “smicons.” I will trace the history of smell science, focusing on the past, present and future of smell synthesis machinery. My thesis is that smells can be used as symbols to convey information, as a unique and powerful enhancement to communication systems.

I will attempt to characterize the circumstances under which smell is a desirable or preferred means of conveying information. I will demonstrate a system that uses scent to signal reminders for upcoming appointments, and I will determine a mixture of scents to convey two or more bits of information for this purpose. I also hope to design and build a more accurate smell output device, or aromatron, than exists today, with the ability to mix two smells and vary the concentration over time.

Thus, we would be able to send a cake to our friend with the smell of it on their birthday and would be able to send a rose to our Valentine on Valentine's day.

Keywords:
Aroma, Smellputer, Smicons, Smell

I. INTRODUCTION

Your computer stinks! If you have one of the new scent producing computer peripherals on the market, this statement might not be meant metaphorically. Imagine receiving an email from your valentine and it contains a picture of a beautiful bouquet of roses, complete with their delicate sweet scent.

People have been experimenting with scent generating technologies for nearly 50 years. For example, one of the most famous experiments involved an invention called Smell-O-Vision. This was a device or process developed around 1960 to enhance the experience of watching a movie in a theater. The system used bottles of scent attached to a rotating drum. The various scents would be released by signals in the film itself and delivered to the audience through pipes running to each seat. Although the system worked, only one film was ever made, Scent of a Mystery, and the man that invented the process lost his investment and left the film business.

In November 1999, a long article in Wired extolled the virtues of a new, up-and-coming startup that was going to change the world: Digiscents. Reporter Charles Platt was clearly impressed by the demo of the prototype iSmell device and Digiscents’ vision of the future: scented Web sites where visitors could sniff cigars before purchase, or driving games in which players could smell burning rubber and gasoline fumes. Digiscents put a lot of effort into its partnerships with Web site owners, signing up several large companies, including food, drink and consumer goods companies. However, they never did manage to manufacture the iSmell, purchase a company with an existing technology, or find an alternate hardware manufacturer to build a similar device, and went out of business in April 2001. Since that time, there have been several companies exploring the business space: to my knowledge, only Trisenx has a PC controlled multiple-scent output device that they expect to be commercially available by press time.

II. SMELLPUTER FOR SERIOUS PURPOSES

The main question is why such a computer should be developed?

Here are some of the reasons why such a computer should be produced…

A. Smellputer for the Blind People

We know that Blind People are from that group of people, for whom computers are hard to operate. If a computer producing smell is made then this section of people would get the highest benefits of such a computer.

If the computer is made just for blind, then they could incorporate some extra features for them rather than just providing smell for the other normal people. The computer could have some features which would make the task of operating computer easy for the blind.

These features can include different smell for different menus, each which could be easily differentiated from the other, example: File menu has the smell of rose, or the View menu has the smell of baked cake, etc.; Different smells for
different type of files, example: the zip file could have the
smell of egg, and the doc file could have the smell of
chocolate, and so on.

The features should be decided after concerning to a group
of this people, who could understand what would be the most
helpful for them.

B. Smellputer for Security Purposes:

As the science says, every person has a different body odor,
and so a machine could recognize the person with his odor.
This property could be used for Security purposes.

The smellputer can designed in such a way that it would
recognize the odor of different people and differentiate it from
the other.

This could be used in places where the need of security is
very high, example: Research center. Here the computer would
be designed in such a way that it detects the odor of the person
and allows only the ones which are authorized to go inside the
lab or the secretive areas. It can also be used in places like the
banks, where the lockers are kept, and the locker opens only if
the authorized person comes to open his locker.

This system can also prove to be helpful to catch criminals.
This can be made possible if a device detecting smell is placed
at public places like, airport or railway station. The device
would scan the body odor of different people passing through a
specific area, if the criminal passes through even one of these
areas then the police would be informed that the criminal is
present at that particular place, and this could prove to be
beneficial for them.

The smellputer can also be used to warn in certain cases.
Suppose there is an animal present in a particular building, the
building has a smellputer which warns them if an unwanted
creature is present in the building, then the smellputer would
produce a certain kind of smell to warn the tenants about the
animal.

Thus, in all this ways a smellputer can be used to maintain
the security of a particular place.

C. Smellputer as an Online Marketing Tool

This is a massive market which will continue to grow as long
as man lives. We live in a world where the best product or
website is not necessarily the most popular. Marketing and
advertising is the key to success in the world today, because if
no one knows about your product no one will buy it. Factors
including brand loyalty, repeat purchases and referrals are
essential to any industry that exists today. Even a charity is
business that unlike the traditional business doesn’t operate to
maximize profits, but will still rely on its brand to attract
donations.

People will not eat in places that smell horrible, and as
humans are programmed to remember great experiences for
longer and with more intensity when associated to a smell.
Everyone has good memories, perhaps of when you were
young, or with a partner, and these memories are associated
with smell. Sometimes a smell can trigger a memory, a brand
or an experience. Aromas trigger memories. Memories

influence emotions. Emotions set moods. And moods dictate
reaction. Differentiate yourself from every other advertiser by
adding smell to your ads, well initially anyway the idea is
going to sell like hotcakes – but the idea is to develop your
brand, something done over a longer term.

If you’ve ever walked down the coffee aisle at the grocery
store and suddenly wanted a cup of coffee, you know how
effective aromas can be in marketing. Imagine shopping on the
Internet for coffee, or oranges, or exotic spices. Would you be
more inclined to purchase some if you could not only see them,
but smell them as well?

This could be useful in marketing different products like
flowers, perfumes, spices, coffee or tea, or any baked food, etc.

D. Smellputer as a Teacher

It as been proven that association is an excellent way to
remember and learn. Adding smells to a young Childs
educational program is a sure fire way to speed things up. This
idea is especially important for children with learning
difficulties or disabilities, making the experience a more
enjoyable and memorable one.

Smell is a powerful learning tool. Educators have known for
a long time that the olfactory senses help reinforces learning
and aid.

For example when teaching children the alphabet educators
tend to use cards or images, so for the letter A there would be
an image of an apple, this could be combined with the smell of
an apple to increase retention and promote scent awareness.

Or think if, in biology class studying the anatomy of a skunk
via the Internet, when suddenly the skunk sprays. Yuck! You
stink!

Later on in science class, while traveling through space on
the NASA Web site ... whoosh! ... a meteor buzzes your ship. It
comes really close and leaves the air smelling of sulfuric acid.

This will become increasingly important in the world of
tomorrow as our children’s education moves away from the
tradition classroom to a more online or virtual experience.

Not just for Elementary teaching but for higher education
this can prove to be useful.

There are also benefits for other educators or training
programs, for example the training programs currently taught
at airport security and some police forces. Educators are
already saving money on class room costs as courses are
moving online. For Airport security and the like it is very
important to be able to smell explosives and distinguish
between the different types of smoke. All this information can
be stored online and accessed online at anytime, anywhere in
the world.

Another application is use in Psychoanalysis, anyone
working in the Fragrance industry will know companies
compile details of their customer’s demographics and are able
to create a scent that will appeal to the majority of people in a
specific demographic. It seems logical enough to assume that if
this system was reversed and a person was asked which scents
they liked from a specific library one could categorize the
choices so as to assign them to a particular social grouping.
This can allow employers or other agencies to gauge a person's intellect, emotional stability, behavioral tendencies and more.

E. **Smellputer in Medicine**

There are also applications in the medical field. There have been studies showing a link between olfactory deficits and certain brain disorders, such as Alzheimer’s, Huntington’s, and Parkinson’s. Scent output technology would allow doctors to differentiate these from other conditions. This may help them to understand the human body system in a better way.

It might even be possible to use the technology to train doctors to diagnose certain medical conditions by smell. A disease can be diagnosed by many different ways by smell. Example, the breathe of the person, or the body odor of the person or the odor of a person's urine. Thus, we just need a “nose for computers”.

The smellputer can be enabled of all these smells. And thus it would be helpful to doctors to learn as well as to diagnose in a better way.

F. **Smellputer for Aromatherapy**

Customers can access a range on online or DVD based aromatherapy courses designed to maximize emersion and relaxation. Other applications can extended to emotional manipulation whereby scent tracks can be adapted for the depressed or unhappy. The recent surge in yoga, meditation and other well being courses is a good reflection of the surge in the alternative treatment and therapies market. One could create a home Spa kit where the client would be given a range of skincare products and creams, perhaps a daily relaxation program and a relaxation CD with a scent track.

This type of content can be easily marketed and sold online. A Full aromatherapy or well being course could be developed, to include perhaps a 1 hour video containing relaxing images and music and maybe an array of changing colors. The scent track would be composed to achieve the desired state, through shifting emotions and manipulating stress levels. Everything can be easily transmitted online, perhaps for a subscription service users will be able to log on and watch online as part of a daily program or downloaded as a one time product. There are a multitude of programs and courses that would greatly benefit from the edition of an extra sensory stimulus. Even most self help books today convey the importance of a positive mental and emotional state both of which can be achieved and maintained using smell and positive mental association. Studies have shown that smells can effect a humans mood and emotion by and average of 40%, this could be the pivotal point in the success of a DVD, wellbeing or similar program

G. **Smellputer Training the Mechanics**

Or to train aircraft mechanics to detect specific problems by smell. There are some problems like leaking of oil or gas which could be better detected by smell. The experienced mechanics know about it as they have smelled it many times but an amateur mechanic would not get it by just smelling. But if at the time of teaching if they are enabled with such a smellputer then they would be able to detect the problem easily.

Not just air craft mechanics but mechanics of factories can also be made to learn to detect the problem with the help of smell. This would prove very useful to them.

III. **Smellputer For Entertainment**

A. **Smellputer in Games**

The benefits are so obvious, with many of them having already been explored. Smell will ensure a more memorable and engrossing experience for the player, possibly even an avenue for a series of murder mystery games like the classic Cluedo board game Virtual reality simulators would benefit from any extra sensory stimulus to heighten the sense of reality, the benefits of which despite being obvious have been extensively researched for many years.

As an example, imagine a racing game where the player can smell rubber burning as the tires squeal or smoke when another car blows its engine. Since odors have been linked to emotions, such as fear or excitement, this kind of technology promises to create a more realistic experience in these kinds of entertainment products.

The gaming market is huge and is anticipated to be an area of massive expansion for this technology. Some developers are already experimenting with games and have found that when smells are released in low concentrations they are picked up by the sublimal part of the brain and have a greater affect on the player. This ensures the players attention remains on the task at hand and the experience is a more immersive and realistic one. When smells become noticeable they can become a distraction, and take attention away from the game. Some of today’s devices are able to release very precise volumes of fragrance or air, and have options to set the cycles to achieve various effects on the audience.

B. **Smellputer for Music and Art**

Scent is a fantastic tool for an artist, allowing then to truly express and convey their message though multiple senses. If a picture is a thousand words then a scent is a thousand pictures, and this is evident in many humans, where a single scent is able to provoke a stream of emotions and images.

Many Art houses and exhibitions tend to keep an inventory dated to the same or similar time period as the décor and architecture of the venue. The idea is to create an atmosphere and setting similar to the ambiance associated to the artist or piece of work. This can be further enhanced or introduced to the audience for the first time through the power of smell. Scents have the ability to render past emotions, or encourage ones imagination, and immersion into the piece. This would be most beneficial for online art galleries or sites such as Flickr who keep a library of photos for sharing and viewing online. The addition of scent to an existing physical galleries website can help enhance the brand and subconsciously encourage visitors.
C. **Smellputer for Movies**

All great movies engage the viewer in every aspect, the action, the emotion, the story, subplots, and the directing. The addition of key scents can amplify almost every aspect of a film. The director will be better able to establish the place and season, helping to develop an environment much like they do in virtual reality. Smells are known to trigger emotion and memory because smells. This knowledge can allow the director and associates to develop characters with emotional, behavioral triggers in the audience. Smells can be excellent in setting the mood and drawing the viewer in and even evoking tears and laughter.

Several studies have shown bad smells like the smell of pollution and valeric acid can affect behavior and emotion. Even in seven parts to a million, which is only just detectable by a dog, results proved negative emotional and behavioral changes in humans.

Eventually it can be hoped that part of the ever increasing film budgets would would explore the possibility and benefits of adding another sensory element to the film, after all they have finally mastered the color picture and sound. Yet there remains a totally new market in theaters and the ability to film a theater show, reproduce it on DVD, and offer viewers the same indulging experience in their homes through subliminal scent messages.

D. **Smellputer for E-mails**

The sense of smell is a nice and easy addition to the text, pictures and sound, which can already be incorporated in to an e-mail. Users will have the ability to create their own scent masterpiece and share it with the world. There does exist the threat of the numerous spammers and marketing companies bombarding you with smell-e-mails, however the user has ultimate control of when they turn on their scent device.

Thus, one could just “Just Click and Sniff”

Maybe you are an aromatherapy company to which clients have signed up with to receive smell-e-mails promoting new courses or programs that they may be interested in. Maybe you are a marketing company who would like to distribute free samples to your client list. There are many opportunities both for recreational and business purposes, including sensory branding. An online store that either sells or assigns a scent to your caller ID, a specific smell of your partner or friends.

E. **Smellputer for Novelty Items**

This is an area that is already taking off on social networking sites including Facebook and MySpace. Some of the existing novelty items include a virtual drink which you can purchase and send to a friends, perhaps as a birthday treat. More relevant novelty ideas include E-cards, Love Cards, and a bouquet of red E-Roses for Valentine’s day, strawberry kisses, postcards from the beach, scented screen savers etc. The market for novelty items is huge and an unavoidable market, especially when considering the many birthdays and holidays during a year.

With increasing integration of computers into our daily lives in the form of palm tops and mobile phones, it is inevitable, just as e-mail has replaced a lot of traditional mailing, e-cards will replace many traditional e-cards.

Imagine the ability to create a powerful cartoon series like South Park or The Simpsons except it is more unique because you have smells. Maybe you can market your series online and smell-e-mail your viewers every week with the new aromasode. Maybe your catchy gimmick will be the smell of dynamite when your Kenny like character dies in every episode. Maybe a where’s Wally character that children search for throughout the duration of the cartoon? Maybe they are alerted to his presence with a key smell?

Yet another idea that has been catching on in recent years is bed time stories for kids. One can visit a website and download a video that reads a story to your child as they fall asleep, it would be so much more magical if you could encourage their imagination with the addition of smell. The possibilities are endless.

F. **Smellputer for Phones**

Have a mobile phone? Then download a smell-e-tone!

The mobile phone market is huge and one of the fastest growing at the beginning of this millennium. Millions of ringtones are downloaded everyday. Imagine you could text a smell or assign a scent to your caller ID, a specific smell of your partner or friends.

IV. CONCLUSION

The list of applications for this technology goes on and on, and once the technology hits the shops there will be no turning back. There are still hundreds of avenues being explored; content is being developed you read this, hundreds of institutes and researchers are working everyday in various industries to expand this exciting and lucrative market.

Imagine a time when you can purchase the latest movie memory cards from your local retailers (or order online) and receive a free scent chip. You return home and insert both chips into your fully integrated wall mounted OLED TV, and benefit from the most immersive entertainment experience you are likely to experience from a machine.

The Sony Playstation seems to half in size every 2 years, its only a matter of time until they are able to harness the potential of a fully fledged gaming PC (or MAC) and integrate the entire experience, including smell into your TV. Of course this might mean less money for the hungry electronic giants but am sure revenues from the brand specific memory cards, game sales and scent chips will help the situation.

One thing is for sure: like the iPod when this technology becomes integrated, it will be hard to believe we survived without it.