

EXPERIENCING DIGITAL LIVE FRAGRANCE (DIGI-FRAG): AN INNOVATIVE TECHNOLOGY

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ABSTRACT:

Digi-frag is device which Analyze image or video presented on the screen of Tv or Mobile and then accordingly generate smell of any object (can be food, flower,etc) displayed on that screen.Digi-Frag is a device by which user can experience smell, aroma while enjoying any cooking show and user can also experience smell of foods shown in the movie. This device will enrich and increase user experience towards digital world. This can also be used with social media, like if any social media user send's some photo or videoof the food to other user, then by using this device he can experience the smell of that the object present in that media.The main purpose of this research is to make such device through which user can smell the aroma of that particular media.

Keywords: *smell, Digi-Frag, Application, digital, media.*

1. INTRODUCTION:

This device enable user to experience smell of any media (video and picture). This device will look like a mask, which user can wear and this device is connected to smart phone or smart Tv. And this smart tv and smart mobile will have an Digi-frag application which will act as mind of this device, it can collect voice command like chef says this is pasta, burger, curry. So this app will identify that voice command and send appropriate signal to our device or it will analyze that particular video or picture and Identify the object (food, flower, etc) which is present in that picture or video and the information of that object is given to our device. And according to given input it will emit the appropriate smell which is emitted through hole in front of nose^[fig. A]. And it can also manage unused smell by another outlet which is located exactly opposite to emitter, which will be responsible for removal of smell which is not needed at that particular time^[Fig C], like suppose user is watching a movie which have number of different scenes and each scene contain different objects then if this device

willemit smell of one food/flower And after it switching to next scene in which it have different object then previous smell can interfere the current Smellso to handle this there is smell remover outlet which will suck unwanted smell from air and throw it behind the mask^[Fig C]. So user will smell only current odor. For this it also use different techniques like for what period of time it will throw the smell and on what time it will be removed.

2. OBJECTIVE:

There are various devices like Tv, mobile through which user can watch and hear anything, but user can't experience the smell. The main objective of this research is to make device (*Digi-Frag*), which user can use with of Tv or mobile to experience digitally generated smell. It will analyze the media and accordingly generate smell.

3. LITERATURE REVIEW:

3.1 Evolution of Artificial Production of Smell:

The idea of making smelling machine is appeared in 1960 film Scent Of Mystery. This film is opened in three theaters which is equipped with smelling mechanism and this three theaters are New York City, Los Angeles, and Chicago. But even if mechanism was right, and its doing what is meant to do, Still it come up with some problems like hissing noise and synchronization of smell means even if scene is changed previous smell still going to present in the air and causes generation of unwanted odor. And due to all this problems this film failed very badly.^[1] There also some documented cases are available which states that this kind of mechanism is also been practiced in theater.^[1] Like cotton was soaked in rose oil and this is placed in front of the fan and this will then waft the scent in environment. And the method that we saw till now is not dynamic because the machine is not able to identify what is going on the screen and accordingly handle the scent. Typical smell-o-vision machine is nothing but some combination of scented oil and fan for spreading that scent.



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.

Fig. 1. Smell-O-Vision in 1960

^[1]Later in 1970s the Swiss fragrance chemist Roman Kaiser developed the technique which is able to preserve odor. ^[1]He dubbed Headspace capture a process which can analyze and manufacturer the fragrances of the natural world. And then because of this scientist are able to capture the smell from real world.^[1] In the 1980s, the scent scientist Braja Mookherjee, who are working for the fragrance firm IFF, invented a process that allowed technicians to extract fragrant molecules from living flowers, with the ultimate goal of recreating their smells. ^[1]In the late 1990s, Japanese scientists began developing an "odor recorder" which is meant to capture and replicate the world's scents.^[1]Today, the odor artist Sissel Tolas uses headspace technology from he created "scratch and sniff" maps of the world.^[1]Olivia Alice uses a relevant technique to preserve the scents of loved ones that linger on their clothes — by "deconstructing the clothing and extracting its composite and essential elements". ^[1]A 2007 survey of tech experts predicted that by 2015 scent will be convertible into digital data — leading to, yes, a smell able Internet.

3.2 Digitization of Smell:

The first commercially available air design systems was not able to adjust running time, fragrance or scent volume; they continuously run and lead to an—aroma flood. This tends to digitization of smell.^[2] Experts Dexter Smith and Joel Lloyd Bellenson, in bioinformatics and genomics, started process as follows: —so if we can find the substance or essence of smell then we can built a device which can digitalize and broadcast it. Based on this principle only, modern systems offer an adjustment of time and volume and changing between various fragrances.

The digital smelling device is basically a hardware software combination. ^[2]The software part will evaluate the smell equation and generate specific signals for specific smell and hardware part of digital smell will produce the smell and finally that smell will be produced by the device. The hardware device is a device which is similar like speaker, like speaker this device is also connected to the computer system. For this device there is also a driver program which will responsible to evaluate the digital equation for generating specific gas.^[2]Today digitally controlled smell diffusers are not only applied for advertising purpose, they are also developed as ambient indicators like an olfactory display for Human Computer Interactions-systems. DigiScents, an interactive media company, created iSmell Digital Scent Technology, which is intended to broadcast scents over internet (Science, Technology & Innovation Studies).^[2]An integration of an augmented reality application with an odour ma-chine to

improve on the augmented reality experience and it is presented in Emsenhuber et al. 2002. NTT Communications (2007) have developed a smell machine called Aroma Geur, it is laying the path to the first olfactory emails in 2004. ^[2]This device was also used to produce an ambient smell when listening to Tokio FM. In 2005 TriSenx (2005) launched device named Scent-Dome to enable websites emitting scents. Osmooze Personal Diffuser is the system which reached the maturity phase and can be bought now for digital smelling.

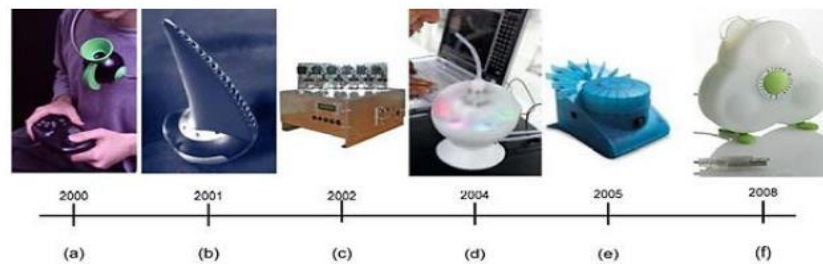
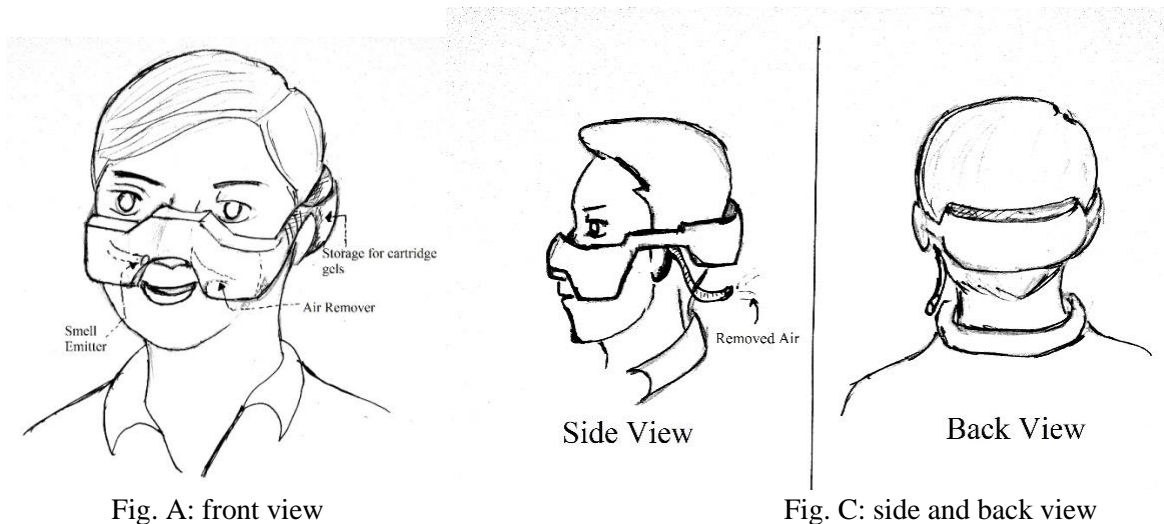


Fig : a. Aromajet Pinoke, b. DigiScent iSmell, c. FH Hagenberg SmellBox, d. NTT Com Aroma Geur, e. TriSenx Scent Dome, f. Osmooze Personal Diffuser

Fig.2: Evolution of smelling device

^[2]Meanwhile, telecommunication industries have also found first scenting mobile phones (cf. Motorola 2007; Softpedia 2007). ^[2]The special smoothness of olfactory interaction spaces was the central subject of the Space-of-Scent-project understood by Haque Design & Research (2002).^[2]For telecommunication industry smell has been successfully introduced as a new sensory modality for interactions between human and mobile technologies.^[2]The first —smellingmobile phones were placed on the market in 2008 (Science, Technology & Innovation Studies). ^[2]The Sony also created Ericsson SO701i which is scented with an aroma therapy fragrance to support relaxing during stressful phone calls. ^[2]To satisfy different things the mobile phone is available with eight different fragrances, and it can also be useful for advertising purpose and tagging personal things. Also Samsung (2006), Hyundai (2005) and Motorola (2007) have developed such mobile phones.^[2] German inventors have already patented a mobile phone with a smell chip which allows sending and receiving smell messages (Science, Technology & Innovation Studies).

4. RESEARCH METHODOLOGY:



Like shown in above diagram our Digi-frag device will look like, There are mainly two sides of this device. First there is front side as shown in figure A which have two main function emission and removal of smell. Smell emitter is located at left side show in the figure and air remover is located at right hand side. The main cause that we use air remover is that, lots of time when we watch any video there will not be single object there are different objects come and go some will stay on that display for long time and some will not, so the objects always change. At that time we want new smell which is again emitted in the same air which will cause interference of the smell so. For that air remover will remove that air on the basis of input given by the controller which is shown in diagram D below. Which is thrown outside with the help of tube which is shown in Fig C (side view). On the other side (back of the mask) of mask there is storage for flavored gels mounted in a circular manner, as shown in figure B. This will emits the smell according input take from controller which is located at the front of mask.

This controller is connected to the application that is installed in smart tv or on the smart phone. The main objective of this application is to find what kind of food, flower or any other object present in that video. So this can be found out by identifying voice commands, like if there is any cooking show going on Tv then the person can pronounce name of that dish so this voice command can be taken as input. Secondly if we don't have any voice commands or voice feeds in video then we can analyze the object displayed on the screen by using image recognition using machine learning. So even if there is on voice command application can identify the object.

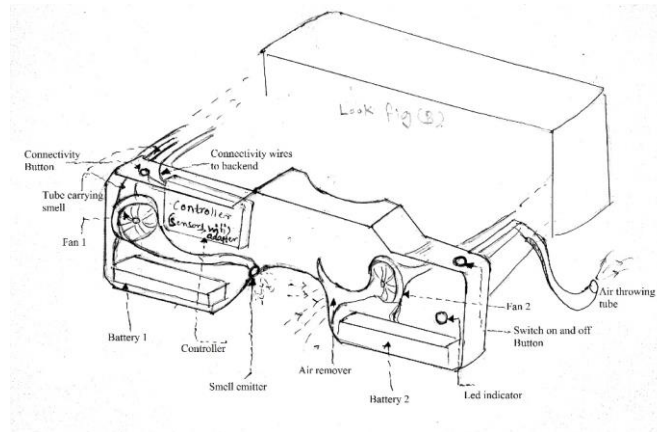


Fig. D: Inner structure of device

This diagram will show inner parts and functionality of the device. First there is controller placed at the upper left side of the diagram near the fan 1. This controller is connected with application installed on our mobile or in smart Tv with help of wifi adapter mounted in device. Application will send appropriate input by analyzing that video or image as we discussed in previous page. This input is taken by controller of device and according to that input it will perform various operation mentioned below:

- 1) First input is carried out by controller and then it will send signal to heater which is located at back side of the device as shown in the figure B.
- 2) According the signal taken from controller heater will decide that which gel should be vaporized.

To perform or to convert gel to vapor we first select combination of thin metal rod(wires) which is placed inside the cylinder of gel. Like shown in figure B there are number of small cylinders each containing specific flavored gel and at the center of that each cylinder there is thin metal rod which will heat, Which is decided by heater.

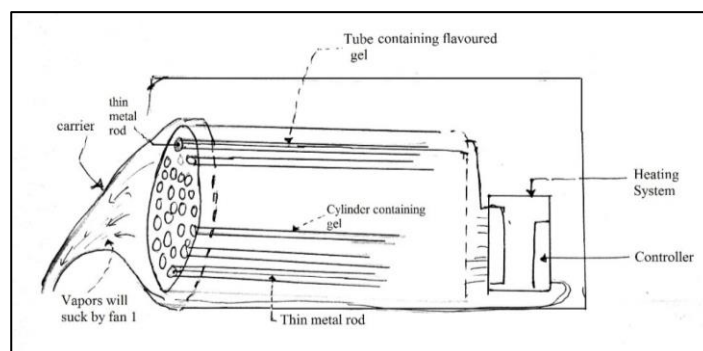


Fig. B: Inner structure of device

According to that, some combination of cylinders will emit the vapors by heating them up. Now here you might think the term combination. So to understand it better let's understand the functionality of nose, how our nose works?

Smell is combination of molecules which will combine and give us specific smell like chocolate or strawberry. And slight change in combination can change the smell that we can experience by our nose.

Eg. Two flowers can have slight change in their individual smells, like wise apple and pear have slight difference in their smell.

So to generate perfect smell we should also know what kind of combination that we can select to generate intended smell.

- 3) So after this vapors are sucked by fan 1 through the tube which is displayed at the left hand side in Fig. B. And emitted through smell emitter as shown in the figure C.
- 4) Now according to the input taken from the application, like if that food is displayed on screen for 15 minutes then device will emit the smell for 2,3 times by keeping some period of gap in between, so user can take that smell of that food for that period of time.
- 5) And after the scene changes, second fan will suck all the air present in that region (region around of nose).

Here to understand why we perform step no. 5 we should also understand that this device will only emits small amount of smell which is enough for sniffing. But even after that there will be some amount of smell present in that area so to remove this we need to perform step number 5 to avoid the interference of different smells. And this air is taken out from back of the device as shown in figure C side view. Without this step it will be very difficult to send new smell and sniff the intended smell. So to make user experience better we perform this step when required.

For social media content, user first have to download that particular picture or video and then he have to load that image into Digi-Frag application. Then that application will run image processing and video processing algorithm and find the object. And accordingly send signal to Digi-Frag device. And it will emit smell according to single.

So there will be smell present in front of users nose and we can as emit another smell as soon as we identify something in the video or picture.

5. DATA INTERPRETATION:

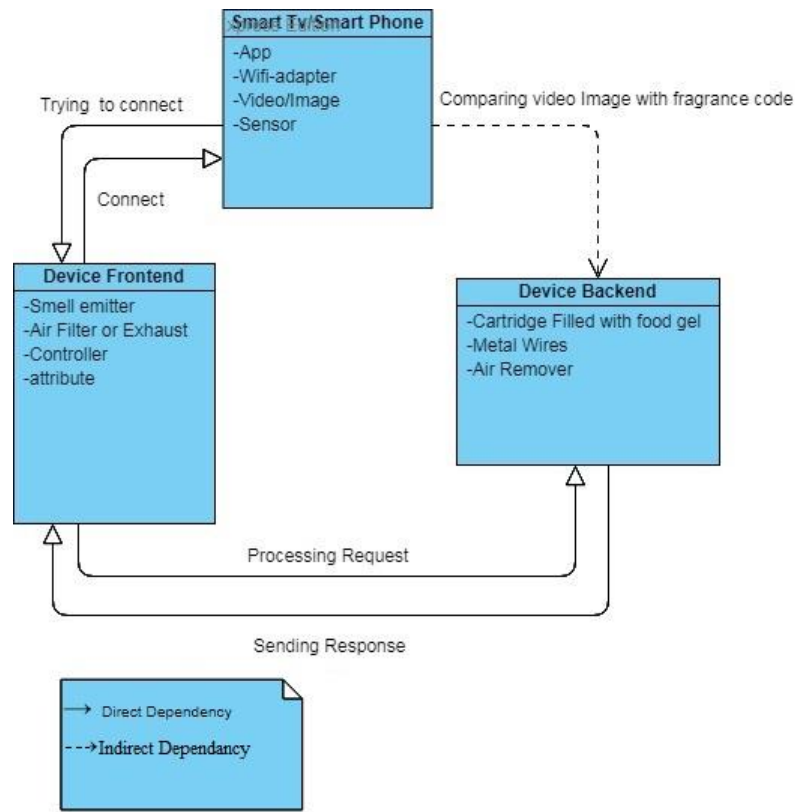


Fig. E: Flow diagram

6. CONCLUSION:

So with help of Digi-Frag we can change whole digital experience of users. User will not only see and hear movies and picture, they will also able to experience smell of foods, flowers, perfume, and environment which is displayed on any screen (can be Tv or Mobile) using Digi-Frag.

7. SCOPE FOR FURTHER RESEARCH:

- We can also improve the input accuracy by implementing live smell capturing device with camera. So while recording we can record smell also. Which will increase the accuracy of this device.
- The size of this device can be minimized so it will become more user friendly. With help of new emerging technologies like nanotechnologies.

8. REFERENCES:

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