

Realization of Perfume based on Human Body Odour

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Abstract: *In a day we pick up thousands of different fragrances, these scents contain natural scents of the people. This natural scent is as alluring as artificial scents, but the presence of these scents gets masked by the perfume we wear. People when choosing a perfume think of fragrance as the most essential thing. In this project we aim to provide the means to enhance this natural scent. To achieve this sensor like the 'electronic nose' will be designed to sense the natural human smell and detect the pheromones given out by the person. This input will be given to an application which will compute the basic chemical components present in the scent and divide them into the ten basic categories of smells (sweet, fragrant, woody, fruity, chemical, popcorn, lemon, decaying and pungent) Along with computing how much percentage of which category is present in the input scent.*

This application will then go on to calculate what other components can be added to enhance this scent and provide the analysis as to what kind of perfume is to be made to the perfumer who can use this data to create a unique perfume or their customers. This system will be able to guide people to choose right perfume according to their odour, skin type, preferences etc. It will assist people and makers to realize the types and kind of perfume that will suit their body according to their odour for long duration of time.

1. Introduction

In a day we pick up many smells and in those smells are present the distinct scent of the odor of individual people. The detection of these odors is possible with different types of odor detector sensors or electronic nose (e-nose). Electronic nose devices or other odor detecting sensors have received a lot of attention and advancement due to the discovery of their various applications across different fields of applied sciences. "Electronic nose is a device which is intended to detect different odors or flavors. They are used for electronic sensing or e-sensing. The expression 'electronic sensing' refers to the capability of reproducing human sensors by the use of sensor arrays and pattern recognition systems. "In an electronic nose the stages of the recognition process are similar to human olfaction and can be used to identify, compare, quantify and for many other applications such as in the areas of Gastronomy, for detection of chemosensory system,

Oenology, Cosmetology, Aromachology, Osmics (study of smells), Aerostatics, detection of pheromones, psychological studies etc. A chemo sensor is a molecular sensor which consists of Nano sized molecules which are used to detect the molecular composition of a signal. The odor signal taken as input in these sensors pass through the receptors which detect the molecular structure (organic or inorganic complexes) present in the smell. These types of sensors can also be used to detect the pheromones which are responsible for the odor of human body. In general people generate unique patterns of odor which can be identified as their unique body odor and this odor pattern can be recognized using e-nose and signal processing. In our proposed project we are going to realize a method to make perfume for people based on human body odor. With this method people can wear a perfume which compliments their individual body odor and highlights their scent.

2. Literature Survey

A lot of research has already been done to realize the applications of electronic nose, e-sensing of smells, gas smell detectors etc. Some of this research has been followed to come up with an efficient way to execute this project. It has been observed that the networked E-nose has been used to determine the pheromones which are given out when the person feels fear. This scent is a unique composition of chemicals released when the person feels fear. The E-nose detects this composition and filters out other smells. However, this research is not widely available as it is only theorized. Another research has been made to identify an individual person based on their armpit odour using electronic nose. This device is made for homeland security who required a solid method to identify criminals. Body odour recognition allows confirming the identity of a person on their unique odour pattern. They have used an array of metal oxide sensors to build a networked electronic nose which detects and identifies the body odour from the armpit region. Using Principle component analysis (PCA) pattern processing and discrimination is performed.

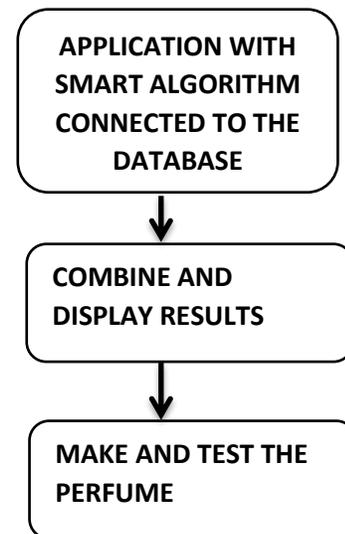
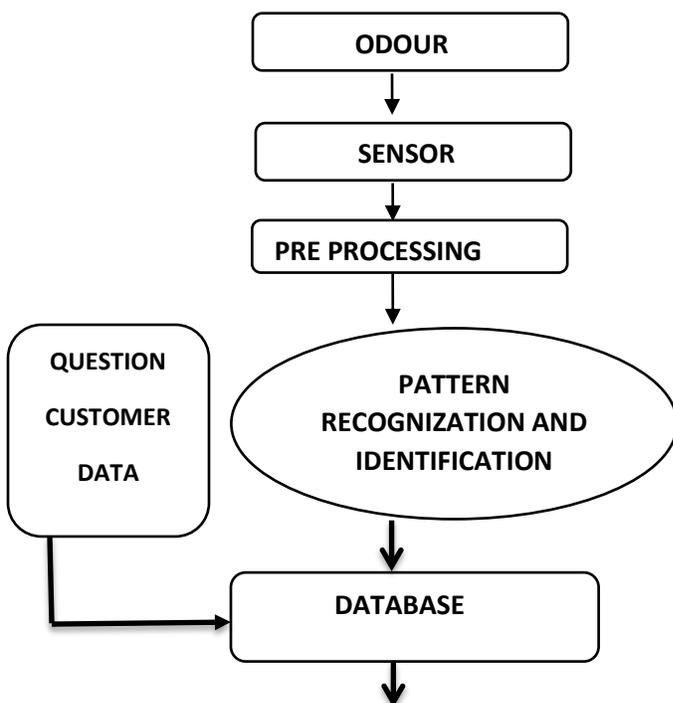
Similar research to our project has been made where e-nose has been developed for evaluation of fragrance and human body odour in the cosmetic industry. In their proposed system they have developed a gas array sensor

and an electronic nose together with artificial intelligence for tracking body odour for personalized beauty. As a lot of cosmetic products have fragrance in their making and composition, people prefer cosmetics like blush, foundation, eye liner, cc cream, lipstick, body lotions, hair spray, etc. which give out good smell. In this research they have selected cosmetics according to a human's body odour and their skin types. They have observed the results that e-nose can evaluate fragrance, artificial sweat and water. It has the potential to identify people according to their odour and evaluation of fragrance.

3. Objective

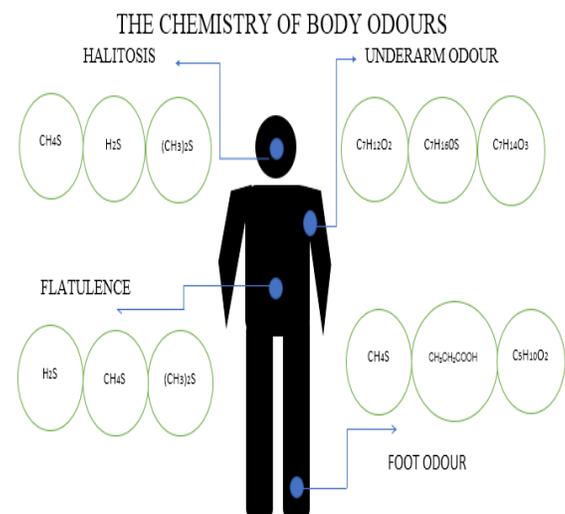
The main objective of the proposed system is to reduce the manual human efforts as in the process of making perfume to identify and formulate the chemical composition (for synthetic perfumes) always an expert perfumer is required we will use AI and machine learning programming to compute the components, percentage of these components required in the perfume to be manufactured for every specific individual. This method can revolutionize the manufacturing of perfumes in the perfume industry. As perfume industry is already growing in a boom, this method can contribute to progress it further.

4. Block Diagram of the Proposed System



5. System Description

5.1 Body Odour Chemistry



1. HALITOSIS

Halitosis is an unpleasant odour obtained from the mouth usually known as bad breath. It can be caused by poor oral hygiene, consuming various foods, drinking, smoking, dry mouth or due to other conditions. It basically contains chemicals like methanethiol and consist of putrid smell. DMS $(\text{CH}_3)_2\text{S}$ is an organo-sulphur compound which has a very disagreeable smell. Hydrogen sulphide is chemical compound which has a foul smell like rotten eggs.

2. UNDERARM ODOUR

Body odour is present in all species like animals, humans or even a child. But there may various measures or reasons

due to which can be genetic, influenced by diseases and physiological conditions. It consist of chemicals such as (E)-3-Methyl-2-Hexenoic acid, (S)-3-Methyl-3-Sulfanylhexan-1-ol and 3-Hydroxy-3-Methylhexanoic acid.

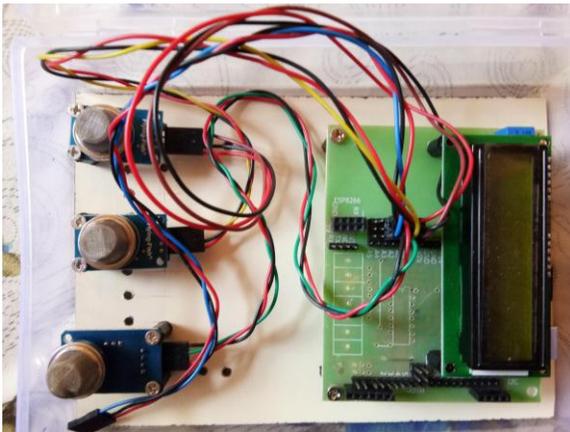
3. FLATULENCE

The problem mainly occurs in the stomach. The problem mainly occurs due to unwanted gases occurs in the stomach. It is caused due to foods which has a high number of polysaccharides. The foods consist of beans, lentils, dairy products, onions, garlic, potatoes, cauliflower, radish, etc. The chemicals present in flatulence of stomach are hydrogen sulphide, methanethiol, DMS.

4. FOOT ODOUR

Foot odour is also known as bromodosis which targets the human feet. It occurs in humans due to excessive perspiration and even due to the growth of bacteria on the foot. It consists of chemicals such as methanethiol, propanoic acid and isovaleric acid.

5.2 Hardware



The components used in the making of prototype are Arduino board having ATMEGA 328P microcontroller and array of sensors. The analog pins of the Arduino board are connected to the Tx and Rx pins of the gas sensors. With this the measured concentration of the gas detected by the sensors can be displayed on the LED screen as well as can be displayed on the computer screen when required.

We have selected the gas sensors to detect chemicals which are present in the odor of a human body refer to fig 7.1 keeping these parameters in mind the sensors responsible to detect the chemicals with respect to odor are:

- 1) MQ2 - propane, methane, alcohol, hydrogen
- 2) MQ135 - ammonia, sulfide, benzene

3) MQ136 - Hydrogen Sulphide

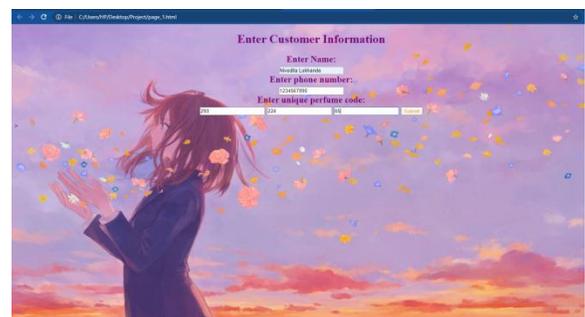
A gas detector measures and detects the concentration of different gases in air. Electrochemical sensors have thin film cells present under the thin metallic cover which are extremely sensitive to the gases. These cells interact with the gases in the air or the smell provided are display the concentration from the range of 0-1024 when the reference voltage is given of 5V. So, with the help of this concept we have given the input smell of a t-shirt worn by a person to the gas sensors and documented each number shown as result of the sensor output. This number will be used as the reference when computing and comparing with the concentration obtained from the objects or essences given as input which can fall into different categories of smell. This criterion will be used to differentiate the customer's scent into the ten basic categories of smells (sweet, fragrant, woody, fruity, chemical, popcorn, lemon, decaying and pungent).

5.3 Software

The data obtained from the hardware and the customer details from the google form will be stored into the database:

The perfumer will find the end results displayed in the app/website as he/she searches for the keywords such as the customer's name, unique perfume code etc.

Working sample of customer be displayed on the website used by the perfumer:



After submitting the unique perfume code will be recorded and analyzed and matched with four basic perfume notes fresh notes, floral notes, oriental notes and woody notes. The result for this sample:

