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RESEARCH ARTICLE

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# ELECTRONIC SNIFFER SYSTEM FOR DETECTION OF PERSON

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**ABSTRACT**

BIOMETRICS is the most interesting & emerging fields concerning security which is the science of identifying a human being based on his biological aspects. Several biometric techniques of identifying individuals are available in the market today. Finger print detection is the most commonly used technique and is available for almost the past ten decades. New techniques like, iris detection, hand geometry, face pattern recognition and voice recognition pattern identification have evolved in the market. But despite the availability of such complex systems still there is no perfect security in ATMs, vehicle safety and some criminals are still escaping easily from the clutches of the police. The reason is the failure of all the above systems in some aspect. Theft, murder, harassments, terrorism are increasing at a rapid rate in today's world. Men in uniform are sitting helpless and the masterminds of this game of life are having the last smile. Cyber-crimes are also at a rise and computer experts are sitting scratching their heads at the cyber cell to nab the culprits. Under such circumstances there arises a need of a security system that could help the police to trace the criminals and reduce the occurrence of such wrong acts. In this paper we have implemented an ELECTRONIC SNIFFER SYSTEM (ESS) to adapt the body odor detection technique.

Keywords: Biometry, Body Odor, Electronic Sniffer System, SAW sensors, Gas Chromatography, Corpus Delicti



## I. INTRODUCTION

BIOMETRICS is the discipline of uniquely finding individuals based on their biological aspects such as ridges & furrows in hand, retina in eye, DNA in hair, etc…Depending on the method of identifying the individuals Biometrics can be classified into

- x Finger print detection
- x iris detection
- x hand geometry
- x face pattern recognition
- x voice recognition pattern identification
- ✓ Body odor detection

There are several techniques available but still crime occurs because of the drawbacks and inaccuracy of those systems. Body odor detection technique is an exception to those cases because, whenever a criminal leaves the area of crime he leaves behind

certain amount of odor molecules in the things he touched or the place where he stood. Whatever precaution the criminal may take, like wearing gloves to avoid fingerprints, carefully dressed to avoid any tissue samples like hair which can be used for DNA test, he cannot get rid of the odor particles.

. The Scientists from all over the world has proved that all human beings emit odor that are unique to them. Medical researcher Lewis Thomas after conducting research on human immunity genes had already suggested that every person has a unique body odor.

## II. SYSTEM ANALISYS

Here we have introduced the electronic sniffer system that would do the above task of sniffing the samples. The biggest advantage of this odor detection technique is, however hard we scrub or cover ourselves in deodorant, we cannot entirely obscure our own 'sniff signature'. One may think that what if a person does not smell at all? The answer to this is that we all humans constantly emit certain odor molecules from our body, which is sensible to our ESS.

Sensing system allows tracing odor from the environment. This system can be single sensing device, like gas chromatograph or a spectrometer. In this case it produces an array of measurements for each component. The second type of sensing system is an array of chemical sensors. Each odor presented to the sensing system produces a characteristic pattern of the odorant. A data base is constructed by exposing large number of odorant to the system. It is used then to construct the odor recognition system.

## III. WORKING PROCEDURE

Whenever a criminal leaves the area of crime he leaves behind certain amount of odor molecules in the things he touched or the place where he stood. Whatever precaution the criminal may take, like wearing gloves to avoid fingerprints, carefully dressed to avoid any tissue samples like hair which can be used for DNA test, he cannot get rid of the odor particles. The police then can reach the crime area and take the odor molecules from the window or the door from where the criminal entered the place using certain tissues. This is called the corpus delicate. This corpus delicate is now presented to the ESS system and the corresponding pattern of the odor is identified. An important thing to be noted here is the odor pattern is different for all human beings. Then the pattern is saved in the computer. In the next course of investigation the odor samples can be obtained from the suspects and then analyzed by the ESS. Once the pattern matches the ESS will give a beep sound indicating the criminal is identified. The odor samples can be obtained anywhere from the body of the individual. The best place is the hand. The hand is kept near the gas chromatograph and the device identifies and separates the constituents. The SAW detector then produces the odor patterns of all the available chemicals. The data is fed into the computer and saved. For comparison a new set of data is obtained and it is compared with the old one. Computer software helps for this comparison purpose. The odor from the spot of crime should be collected and fed to the ESS.The o/p of the ESS gives the separated molecules to the ratio which is from the algorithm.This is then fed to the system where the database consists of std ratios.After comparison if the ratio matches with the database details the culprit is found and the details about him will be displayed immediately after the data matches.

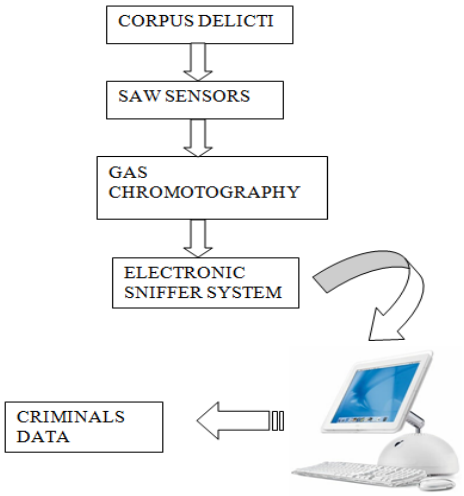


Figure I. Electronic Sniffer System Flow Diagram

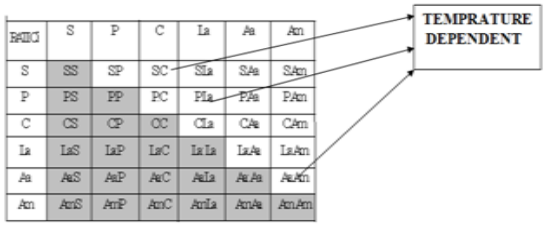


Figure 2. Temperature variance of Elements

## IV. ALGORITHM

The output of the electronic sniffer system consists of proportions of the biological components. We, the human beings consist of the components in the range of values as shown in the table below:

TABLE 1. COMPONENTS AND VALUES

| Components | Range of values |
|---|---|
| Sodium(S) | 51.9 mg [MEN] |
| | 36.5 mg[WOMEN] |
| Potassium(P) | 7.5[MEN] |
| | 10.0[WOMEN] |
| Chloride(C) | 29.7 mg |
| Lactic acid(La) | 360-3600 mg |
| Amino acid (Aa) | 270-2590 mg |
| Ammonia(Am) | 60-110 mg |

By comparing the proportions of the individual constituents a ratio table will be obtained as shown below: the ratio table can be obtained by the comparison of individual constituents with all the components and the results are stored in the data base. By analyzing the comparison table we can find that among the 6 x 6=36 ratios we consider only 15 ratios which are found unshared in the table.We are considering the 15 ratios because all the other ratios are replicas of the other.

## V. EFFECT OF TEMPERATURE

Among the 15 ratios 3 ratios (S:C,P:La,Aa:Am) are dependent on temperature. We may get good results by using the 12 ratios but in order to get better results we include the effects due to temperature. We have obtained the ratios at the normal temperature and the same is uploaded onto the data base.As the ratios are dependent on temperature, if they is any change the ratios get altered according to the values given in the table:

TABLE 2. CHANGE IN TEMPERATURE

| CHANGE IN TEMP($^{o}$C). | S:CS | P:La | Aa:Am |
|---|---|---|---|
| BELOW 10 | ---------- | 0.023/$^{o}$C | 0.108/$^{o}$C |
| ABOVE 5 | 1.674/$^{o}$C | 0.208/$^{o}$C | ---------- |

## VI. CONCLUSION

The ESS if implemented successfully could save the world from terrorism, crimes and also save millions of lives that would have been lost otherwise. In this paper we have designed a system for detecting human beings through their body odor.Scientists worldwide have proved that even fingerprints can be altered but not odor. But the advancement in sensor technology has made us to conclude that whatever may be the odor, its pattern can be easily obtained using the ESS system that we have designed. In future, if we can implement the ESS in an efficient manner we will be able to get the Bio-data of the culprit even with his patter too.We can assure that the proper implementation of this ESS will make the world free from terrorism theft and harassments.

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