



Human Aura Signatures

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Abstract--Today we have come across many Biometric Technologies, but most of them do not assure a temper proof authentication. So there is a need of improved technology, probably by identifying a new human signature. In this paper we suggest using EMF disturbances generated by human body, Known as Human Aura, as signatures in Biometric Devices. EMF produced lies in Extremely Low Frequency Region, As this is the distortion produced in Schumann Resonance. Results of digital signal processing in the ELF band are presented in the report in the graphic form together with the photographic material provided in the course or signal recording. Finally there is a discussion on storage of signatures and processing by device for effective use by Device.

Keywords: Schumann Resonance, EMF, Biometrics

I. INTRODUCTION

Humans are surrounded by Energy Fields which are emitted due to natural Biological Processes. ENERGY – the magical word, is cause of everything, and flows with every living thing. As every human body acts uniquely owing to unique natural characteristics, and Schumann resonance interacts with each body uniquely thereby producing unique interference pattern [4] in form of electromagnetic field. The emitted field is very weak, as it lies in Low Frequency Band (ELF/ULF)[1]. But it can be measured using induced disturbance in Schumann Resonance and hence it can simply be used as signature in Biometric Devices.

A. Human Aura(Human EMF):

Electromagnetic Fields are produced by living cells as there is cell membrane potential. There is electric current that flow in nerves, and helps in signal transmission in our body. Size of cell is about 10 Microns (10^{-5} mtrs), but it is quiet large in comparison to size of electrons, which are basic charge carriers. The length of cell is large enough to be occupied by 10,000 electrons, and the circumference can hold 30,000 of them.

Cell produces electricity by processing certain chemical material, which cell absorbs, which are decomposed under the presence of Oxygen. Communication between nerve cells depends on the parameter called Resting Membrane Potential (RMP). Cell's interior is negative with respect to its surface and potential across its plasmatic membrane reaches the value between -20mV and -200mV. Nerve cell has and RMP in the range of -40mV to -90mV. The sustained value is -70mV. Such cells are polarised and hence they produce electricity. Voltage values are really negligible whereas the currents reach the order of magnitude of mini Amperes; hence they can be appreciated [2].

B. Schumann Resonance:

The **Schumann resonances (SR)** are a set of spectrum peaks in the extremely low frequency (ELF) portion of the Earth's electromagnetic field spectrum. Schumann resonances are global electromagnetic resonances, excited by lightning discharges in the cavity formed by the Earth's surface and the ionosphere. It remains constant over a particular region on the globe.

Schumann resonance is a global electromagnetic resonance phenomenon which occurs due to the space between the surface of the earth and the ionosphere which is conductive, acts as a closed waveguide.

The dimensions of our earth are limited hence this waveguide acts as a resonant cavity for electromagnetic waves in ELF band. this cavity gets excited naturally by electric currents occurring during lightning.

These Schumann resonances holds great importance in the electromagnetic spectrum beginning at 3Hz; extended up to 60Hz, and present as distinct peaks over a range of frequencies starting at 7.86 which is fundamental and others are at 14.3,20.8,27.3 and 33.8 Hz. for an ideal cavity, the resonant frequency of the n -th mode f_n is given by the Earth radius a and the speed of light C [5].

$$f_n = \frac{c}{2\pi a} \sqrt{n(n+1)}$$

At the time when Schumann published his research results in the journal 'Technische Physik', Dr Ankermueller, a physician, immediately made the connection between the Schumann resonance and the alpha rhythm of brainwaves. He found the thought of the earth having the same natural resonance as the brain very exciting and contacted Professor Schumann, who in turn asked a doctorate candidate to look into this phenomenon. This candidate was Herbert König who became Schumann's successor at Munich University. König demonstrated a correlation between Schumann

Resonance's and brain rhythms. He compared human EEG recordings with natural electromagnetic fields of the environment (1979) and found that the main frequency produced by Schumann oscillations is very close to the frequency of alpha rhythms.

Dr König carried out further measurements of Schumann resonance and eventually arrived at a frequency of exactly 7.83 Hz, which is even more interesting, as this frequency is one which applies to mammals. For instance, septal driving of the hippocampal rhythm in rats has been found to have a minimum threshold at 7.7 Hz (Gray, 1982)[5].

This Schumann resonance is like water travelling over rocks or other obstacles, this non-specific frequency is absorbed and re-transmitted producing unique interference patterns by objects it encounters and this interference pattern is affected by all the internal and external properties, as its constituent atoms, cells, molecules, fields etc.[4]

So in case of humans we can infer that due to difference in internal and external properties of every individual human being it is unique, in which human aura also plays a major role, as it also plays a major role in producing interference patterns with Schumann resonance.

II. MEASUREMENT OF ELECTROMAGNETIC FIELD OF HUMAN BODY

The measurement of Electromagnetic signature of Human beings can be done by use of loop antennae of the type, used in measurement of bands ranging from ELF to UHF from very beginning of radio communication. The main advantage of loop antennae being their small size in comparison to the wavelength for they are intended and the source distance. The main is advantage is the large volume of copper winding needed. They measure they Magnetic field only, to compare with their counterpart, which is electric monopole. Figure below shows a loop antennae designed and constructed for this purpose, placed inside an anechoic chamber.

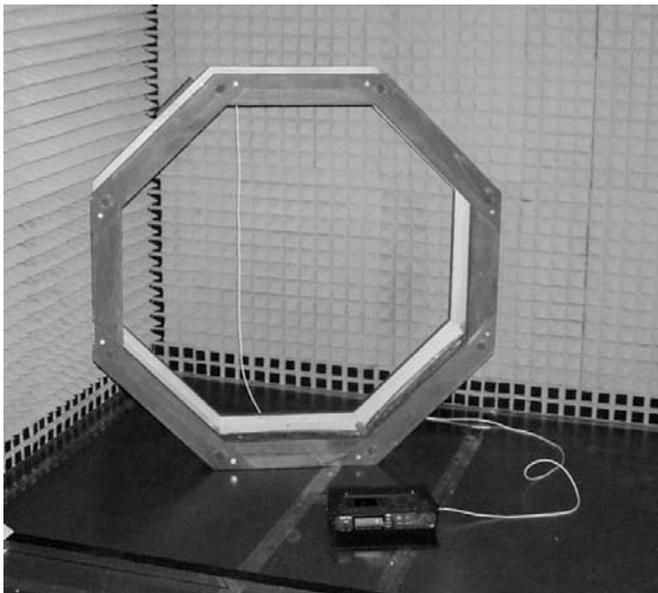


Figure 1: Loop Antennae[2]

The antenna has following electrical Parameters:

- (a) Antenna effective aperture: 118.3m²,
- (b) Loop resistance: 5.98 Ω
- (c) Loop inductance: 31.2 mH.

Low limiting frequency: 30.5 Hz

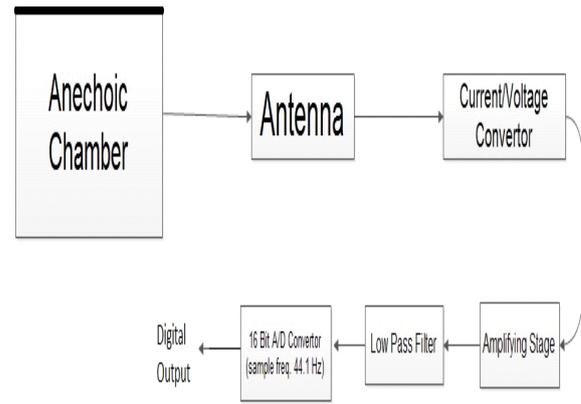


Figure 2: Block Diagram For Measurement And Conversion To Digital Output

III. PROCEDURE

Signal from the antenna goes to the current/voltage converter and then to the subsequent amplifying stages where it gets amplified to a sufficient level. The amplified signal goes through the low pass filter. To filter out the all interference above the 50 Hz band, the low frequency value of the filter was chosen of 30 Hz. Filter output signal was digitised with the 16-bit A/D converter with the sample frequency of 44.1 kHz. The whole measuring installation was supplied from a battery and placed into the grounded anechoic chamber. The signal in ELF range was registered without a person and with a person, alternatively. This is the signature which is processed further.[2].

IV. PROCESSING OF SIGNATURE

The time record of the signal which is shown in fig 5 & 6 is 4 minutes long, where the first part was recorded without presence of a person in the anechoic chamber and the second part was recorded in presence of a person. When these records were made in shielded anechoic chambers it is clearly evident that there is industrial noise present. It can be easily seen that there is an sporadically signals emerging at frequencies 16.87 Hz 8 to 39 periods which shows the above. It is possible that these signals are coming from some noise source which is industrial, as these signals doesn't occur in the observations and measurement done at night[2].

Below are the measurements of Anechoic Chamber, taken during **night** to minimize the disturbance due to industrial noise. First graph shows the reading without the presence of a person, second shows the reading with a person.

Let the default signal measured in room be $N_1(t)$, as shown in fig 3.

Signal measured with presence of a person be $N_2(t)$.

Processed signal output = $N_2(t) - N_1(t)$, which is the signature of the person.

New set of measurements are taken during **day**, which are effected by industrial noises prevalent during daytime.

Let the default signal measured in room be $N_1(t) + n_0$, as shown in fig 4, where n_0 be the noise

Signal measured with presence of a person be $N_2(t) + n_0$.

$$\text{Disturbance created} = (N_2(t) + n_0) - (N_1(t) + n_0), \\ = N_2(t) - N_1(t)$$

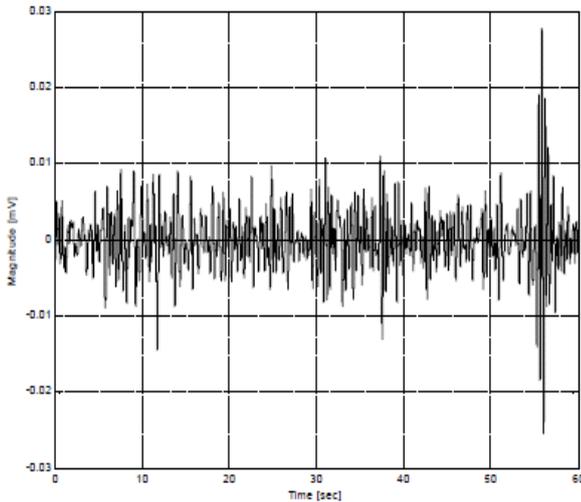


Figure 3: Measurement of Anechoic Chamber, taken during night Without Person[2]

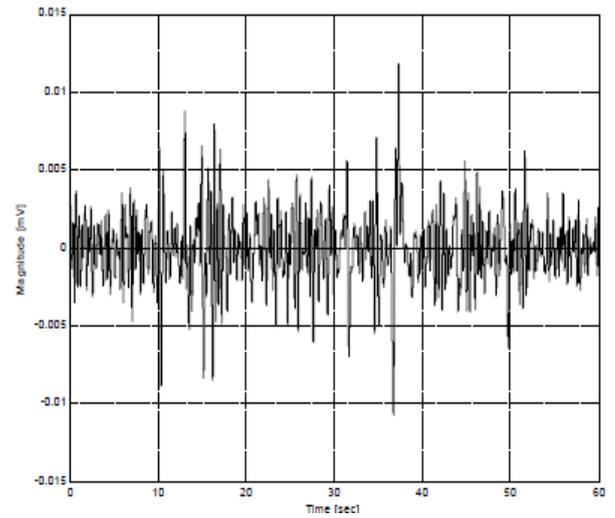


Figure 6: Measurement of Anechoic Chamber, taken during day Without Person[2]

With above calculations, we may conclude that the value of signature will not vary with interference of noise, as the value during day and night are same.

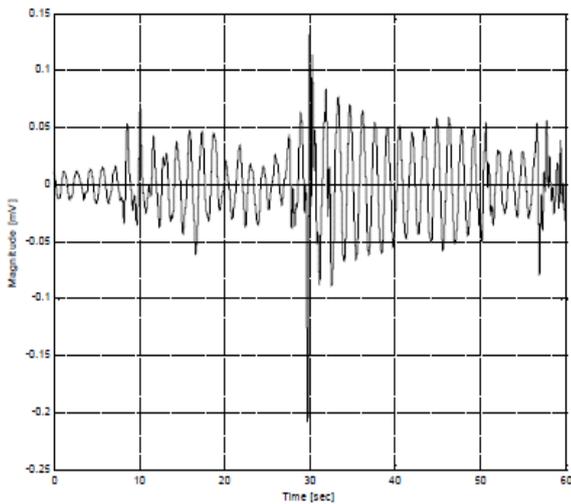


Figure 4: Measurement of Anechoic Chamber, taken during night With Person[2]

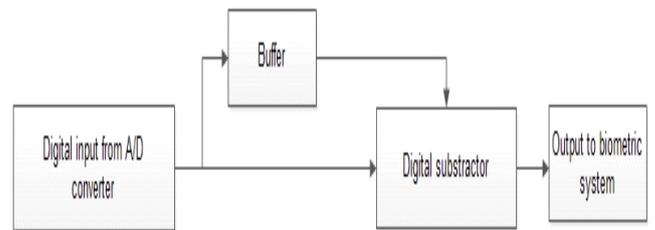


Figure 7: unique signature processing unit

V. SIGNAL PROCESSING

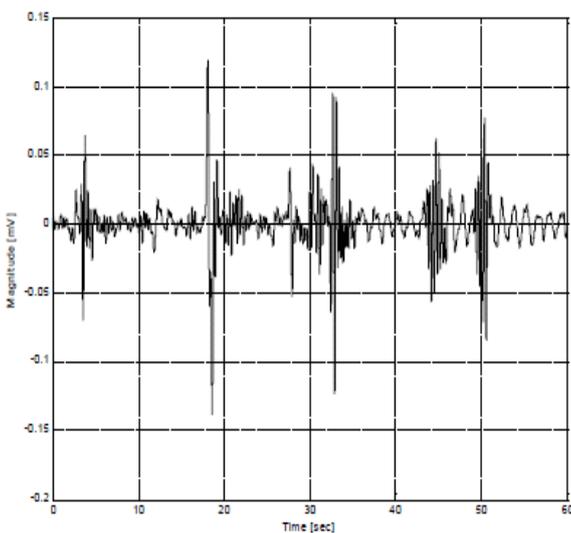


Figure 5: Measurement of Anechoic Chamber, taken during day With Person[2]

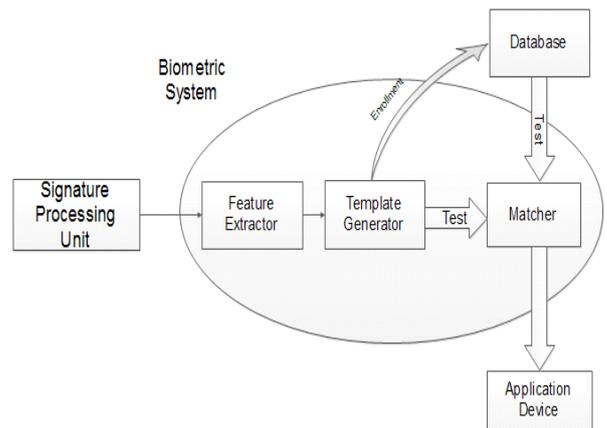


Figure 8: Block Diagram of processing of Biometric System[3]

The processed signal is passed to Signature Processing unit which sends it to feature extractor after which the processing is pretty similar to other existing biometric devices. The processed Signatures are passed to Template generator which provides the templates. These templates are stored in Database. The templates generator also provides the codes to be compared to the templates stored in the database, and the response is produced in accordance.

VI. CONCLUSION

As we have given references so as to prove that the Schumann resonance and the aura of every human being create a unique interference pattern and that can be measured by the procedure explained above so it is evident from the provided material that a biometric device which uses human itself for its authentication could be designed as patterns generated are unique and time invariant.

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VIII. REFERENCES

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