Analyzing the Effectiveness of Anti-radiation Shield in Reducing the Effects of Mobile Phone Emissions

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Abstract – This technical paper investigates the effectiveness of anti-radiation shield in reducing mobile phone emissions using resonant field imaging system (RFI) and artificial neural network (ANN). The RFI frequency counter was used to capture the human frequency of 30 students including male and female students before and after using mobile phone with and without the anti-radiation shield. ANN was then used to further classify between samples using the mobile phone; with and without the anti-radiation shield. Based on the results presented, it can be concluded that the anti-radiation shield electromagnetic wave is effective in filtering off the harmful electromagnetic waves emitted from the ear piece of mobile phone. It is also observed that classification of samples with and without the anti-radiation shield is possible using the characteristics of human bioenergy.

Keywords: Resonant Field Imaging (RFI); Anti-radiation shield electromagnetic wave

1.0 Introduction

1.1 Objective and Scope of Study

In mobile communication systems, the quality of the RF link between a base station and mobile phone strongly depends on the amount of power that is transmitted and received by the mobile phone and antenna design [1]. Nowadays, most users are aware of the potential health-hazard and effect after of using the mobile phone.

The health condition of mobile phone users; with and without the anti-radiation shield for a duration of 30 minutes were analyzed. The perceptron neuron network was used for this purpose.

This system identifies whether or not a mobile phone user is using an anti-radiation shield based on the characterization of the user's bioenergy. The ability to classify between these two conditions show that there is exist a clear change of pattern in human bioenergy and that it is affected by the amount of radiation of pattern absorbed. This is useful for studies on the relationship between the amounts of electromagnetic radiation effect absorbed with human health condition.

1.2 Resonant Field Imaging

RFI is an electromagnetic feedback and imaging process that gives detailed scientific information and objective interpretations for all bioenergy fields of the body. RFI generates complete psychological profiles that fully reveal the role of a patient's psychology in their health condition. Frequency measurements are taken at 23 different points (see Figure 1) due to health analysis around the body using a hand-held digital frequency counter, and the measurements are entered into a computer program that analyzes and interprets the results.

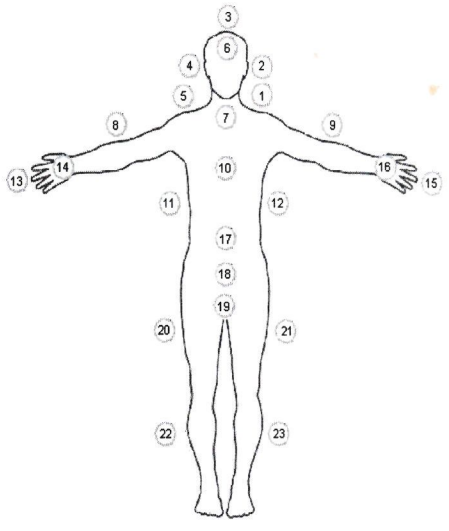

Figure 1: The Human Body Frequency Measurement Points

Measurement from 6 other points known as Chakras were also taken to represent a corresponding area of

the subject's life, like spirituality, physical and emotional healing, level of calmness or nervousness, and self-identity. RFI system accurately identifies and interprets 15 colors of bioenergy, representing all 15 distinguishable colors of the optical spectrum, giving it the maximum possible usefulness for detailed and accurate images and interpretations [2].

1.3 Human Body Radiation

The human body can considered as a complex electric circuit. Based on foundation principles of electromagnetism, any flowing current produces electromagnetic field. Hence, the human bioenergy or the human body radiation is perceived to be produced by electrical currents flowing in our due to the firing of neurons and internal communication within our body.

1.4 Mobile Phone Radiation

Mobile phones communicate via electromagnetic waves. During signal transmission, a comparable amount of radiation travels outward, towards the base station and inward, towards the ear or head of the cell phone user. EMF (Electromagnetic Field) radiation emitted by a cell phone antenna is not very directional - similar amounts of radiation are transmitted outward, towards the base station and inward, towards the ear/head of a mobile phone user where they readily penetrate into the body and are absorbed into the inner tissues [3]. Mobile phones are in effect, tiny radio stations that send and receive. A low frequency pulse, carrying the information, travels on a high frequency microwave [4]. The radiations have sufficient energy to ionize atoms that may destabilize molecules within cells and lead to tissue damage.

Before this many researches have been done to find out the harm that the mobile phone radiation could bring to the user. For this project, the measurement venue was fixed at one place, which is near the Science and Technology Complex at Tower 2. The place is fixed so that the power consumption will not vary.

1.5 Anti-radiation Shield

Electromagnetic waves consist of electric waves and magnetic waves. Frequent use over an extended period of time can be hazardous to one's health. The anti-radiation shield keeps threatening electromagnetic waves away from our daily life. Anti-radiation shield is made of special ceramics and conductive materials to absorb and eliminate harmful electromagnetic waves. Characteristically, electric waves are absorbed into an electric conductor, while magnet waves are not absorbed into any material. A high performing electric conductor is applied to absorb electric waves. The anti-radiation shield is a protective system about the size of a penny that adheres to the ear piece of any cellular phone. The anti-radiation shield blocks up to 99% of the electromagnetic radiation beamed from the antenna, without affecting the quality of our calls. [5][6].

2.0 Methodology

2.1 Use of Anti-radiation Shield Electromagnetic Wave

The mobile phone was directly placed on the ear area. The frequency of the samples body was taken before and after using the mobile phone with and without the anti-radiation shield electromagnetic wave. At first, the anti-radiation shield was not attached to the mobile phone. Call duration for each sample was 30 minutes. Then, the anti-radiation shield was attached to the mobile phone for the second measurement. Results from both measurements were compared.

2.2 Neural Networks

A typical feed forward neural network consists of three layers network which are input layer, hidden layer and output layer. In this network, two layers of sigmoid neuron in the hidden layers and two layers of neuron in output layers were set to test with multi-vector input.

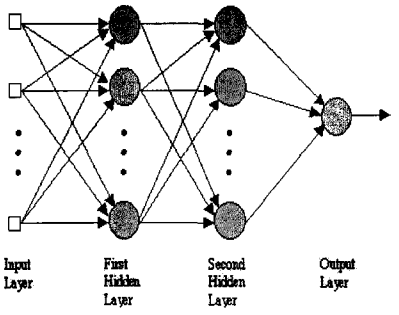

Figure 2: The Neural Network Architecture

Figure 3 shows a neuron model in the hidden layer or perceptron layer of the network. The input vector (P_1, P_2,..., P_n) were multiplied by weights ($W_{1,1}$, $W_{1,2}$,..., $W_{1,R}$) and fed to the summing junction. The bias b, on the neuron were summed with the weighted input to form n, this argument are represented in equation (1).

$$n = w_{11}P_1 + w_{12}P_2 + \ldots + w_{1R}P_{1R} + b \qquad (1)$$

If the Perceptron Learning Rule is used repeatedly to adjust the weights and biases according to the error, the perceptron will eventually find weight and bias values that solve the problem, given that the perceptron can solve it if the problem is linearly separable [7].

2.3 Data Collection

The Resonant Field Imaging (RFI) consists of a hand-held digital frequency counter device together with a specially tuned antenna and computer software [8].

In the Resonant Field Imaging (RFI) software program only 17 distinct regions are considered for health level and 6 distinct regions for endocrine system where bioenergy measurements should be taken. There are 16 colors of bioenergy that will be displayed after and before using mobile phone with and without attached anti-radiation shield electromagnetic wave session which are gold, yellow, orchid, silver, white, cyan, rose, burgundy, green, purple, blue, orange, black, grey, navy and red [9].

There are a few steps that need to be taken before measuring the frequency at the samples' body. Firstly, the initial filter reading of the RFI frequency counter must be zero. Secondly, the range of the frequency taken was set to 3GHz to get a more accurate reading. The researcher also needs to wear a jacket or lab coat and gloves so that his body frequency will not interfere with the samples' frequency. Lastly, when all of the data have been collected, it will be inserted into the RFI software to be translated into their respective colors. Figure 6 shows the flow chart for the procedures of frequency measurement:

2.4 Data Analysis

There are a total of 17 health level regions including lower left leg, upper left leg, left torso (hip/pelvic area), lower left arm, upper left arm, left side of neck/shoulder, left side of ear, top of head, right side of ear, right side of neck/shoulder, lower right arm, upper right arm, right torso, upper right leg and lower right leg [2].

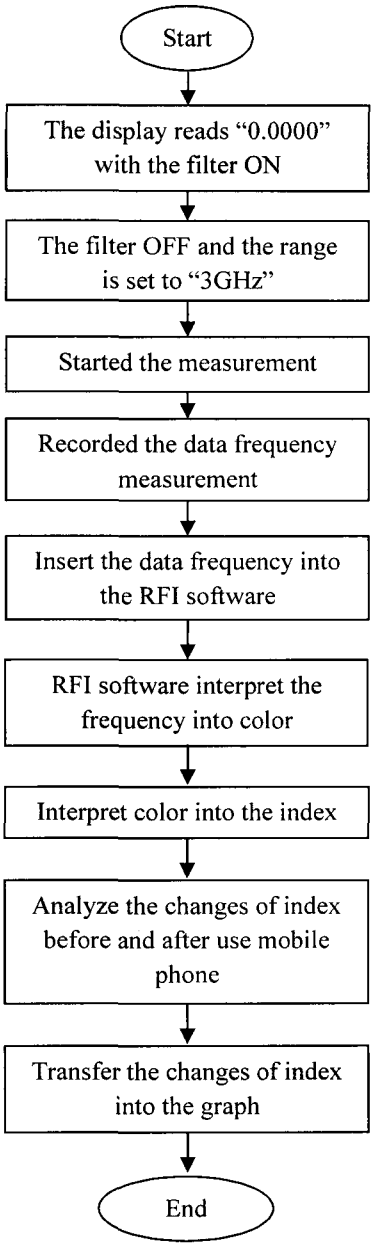

Figure 6: Flowchart of frequency measurement procedures

Table 2 shows the human health index with their respective colors. Based on the color category, the health level of the samples can easily be analyzed.

The output a, in the output layer can be represent as

$$a = f(W_R P_R + b) \quad (2)$$

f is an activation function using tan-sigmoid transfer function which generate output between o and 1.

$f(x) = 1$ for x using anti-radiation shield (3)

$f(x) = 0$ for x not using anti-radiation shield (4)

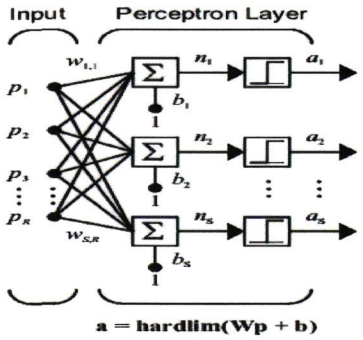

Figure 3: The Perceptron Architecture

To perform the particular function of neural network for recognition systems, a specific target were set and trained until the output of the network matched the target. The neural networks are trained based on comparison of the output and the target. 15 samples were used for training and another 15 samples were used for testing purposes.

Table 1 shows the target for each sample.

Table 1: Target for the both side of samples

Data	X_1	X_2	Group
P_1	0	-1	0
P_2	2	-1	0
P_3	-2	-3	1
P_4	-4	0	1
P_5	0	-2	0
P_6	-1	-2	1
P_7	1	1	0
P_8	-1	-1	1
P_9	0	-3	0
P_{10}	-1	0	1
P_{11}	0	-2	0
P_{12}	-1	-3	1
P_{13}	0	0	0
P_{14}	-3	-1	1
P_{15}	-2	-1	1

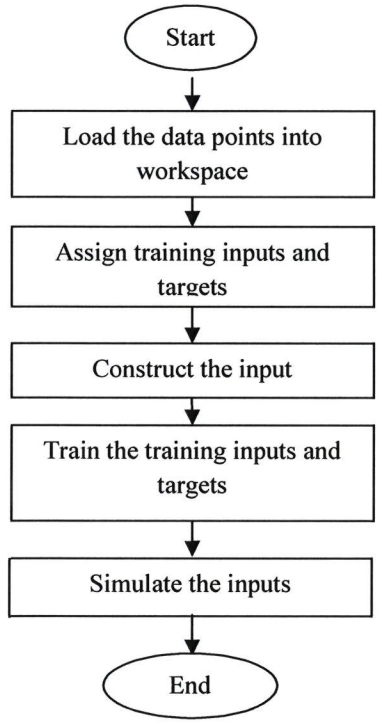

Figure 4: Flowchart of Neural Network Program

2.2.1 Perceptrons

The perceptron consists of a single-layer of neurons whose weights and biases could be trained to produce a correct target vector when presented with corresponding input vector [7].

The perceptron network was chosen because the classification groups are linearly separable (see Figure 5).

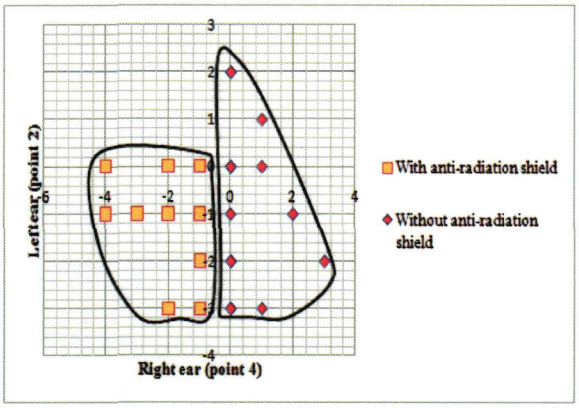

Figure 5: Classification group based on frequency measurement on samples' left ear (point 2) and right ear (Point 4)

Table 2: Color Category [9]

Health Category	Index	Color
Very healthy	5	Gold, Yellow, Orchid, Silver, White
Healthy	4	Rose, Cyan
Moderate Healthy	3	Purple, Burgundy, Green, Blue
Less Healthy	2	Orange, Grey/black, Navy
Unhealthy	1	Red

3.0 Results and Discussion

3.1 Analysis on Human Health Condition before and after using the Mobile Phone without Anti-radiation shield Electromagnetic Wave

Figure 7 and Figure 8 show the health condition of samples before and after using the mobile phone without the anti-radiation shield. Figure 7 shows the result for the measurement on the left ear (point 2) whereas Figure 8 shows the result for the measurement on the right ear (point 4).

It was found that (see Figure 7) 13% of the samples were in the unhealthy category before using the mobile phone and this number has increased to 20% after using the mobile phone. It can also be observed that the percentage of samples with healthy and very healthy condition has reduced significantly.

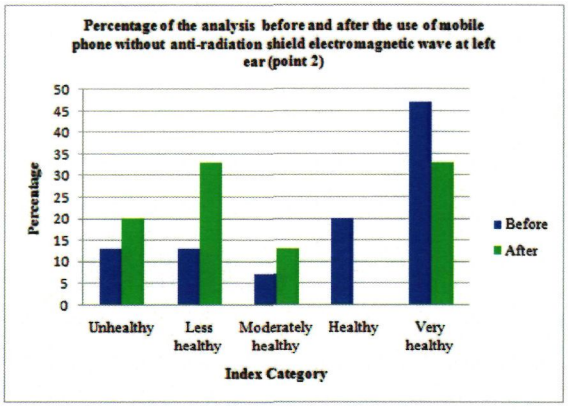

Figure 7: Graph for the percentage of analysis on sample before and the use of mobile phone without anti-radiation shield electromagnetic wave at left ear (point 2)

Figure 8 shows that the percentage of the samples has reduced from 40% to 20% in the very healthy category % when using the mobile phone without the anti-radiation shield. Overall, the percentage for samples in the unhealthy and less healthy category has increased whereas he percentage for samples in the moderately healthy, healthy and very healthy category has decreased.

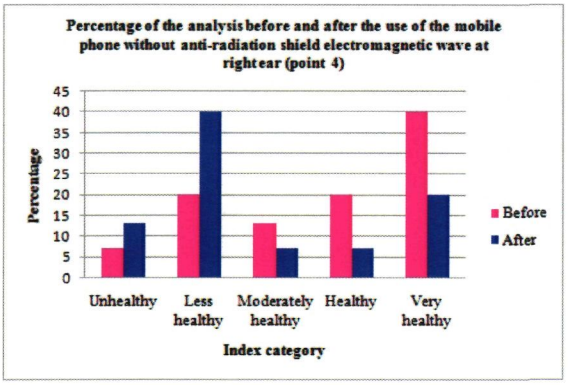

Figure 8: Graph for the percentage of the analysis before and after the use of mobile phone without anti-radiation shield electromagnetic wave at right ear (point 4)

3.2 Analysis on Human Health Condition after using the Mobile Phone without and with Anti-radiation shield Electromagnetic Wave

Based on Figure 9, it's shown that without using anti-radiation shield electromagnetic wave, the unhealthy level of samples is 15% but with using the anti-radiation shield electromagnetic wave, it has decreased to 7%.

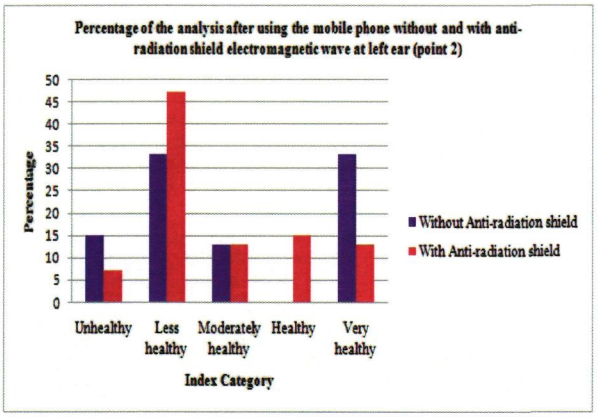

Figure 9: Graph for the percentage of the analysis after using the mobile phone without and with anti-radiation shield electromagnetic wave at left ear (point 2)

From Figure 10, we can see the percentage of the unhealthy level has reduced from 13 % to 7%. For the very healthy level, there are no changes between without and with the anti-radiation shield. It also shows that there is no effect of the radiation to the very healthy samples.

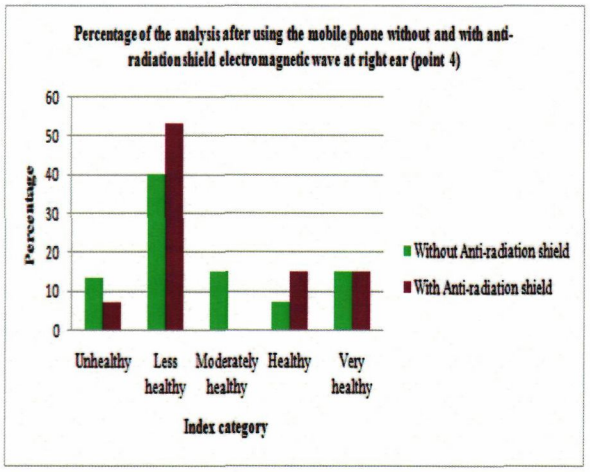

Figure 10: Graph for the percentage of the analysis after using the mobile phone without and with anti-radiation shield electromagnetic wave at right ear (point 4)

Based on the analysis at the left and right ear, it can be concluded that the anti-radiation shield can reduce the amount of radiation absorbed by the human body as it functioning as a filter.

For classification purposes, 30 samples of each with and without anti-radiation shield were taken to be analyzed. From that, 15 samples were used for artificial neural network training. The rest of the samples were used for testing the system.

The output of the network was recorded 1 for the samples using the anti radiation shield and for 0 the samples not using the anti-radiation shield (see Table 3). By using ANN, 100% of the data were correctly recognized. Based on the percentage there was accurate.

Table 3: Result for recognition of used and unused using ANN

Samples	Testing	
	Target	Output
1	0	1
2	0	1
3	1	1
4	1	1
5	0	1
6	1	1
7	0	1
8	1	1
9	0	1
10	1	1
11	0	1
12	1	1
13	0	1
14	1	1
15	1	1

4.0 Conclusion

At the end of this research, the objectives of this research have been achieved. Statistical analysis revealed that when samples used a mobile phone with the anti-radiation shield attached to their phone, their health level improved, in comparison to using the mobile without anti-radiation shield. It can be concluded that the anti-radiation shield is effective in reducing the effects of mobile phone emissions.

For future work, the time to taken for the measurement should be varied and increased in order to produce a more comprehensive and reliable result. The study can be separated between female and male samples and can also be extended to different ages.

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