

Automatic Disabling of Cell phones at Prohibited Areas

K.R.Dhanabalan^{#1}, R.Karthick^{#2} and K.Mohanraj^{#3}

krdhanabalan@gmail.com,¹

#Department of Computer Science and Engineering, Excel Engineering College, Tamilnadu, India.

Abstract- The use of Cell Phones has become prevalent even in school and college students. It has its own advantages and disadvantages. which eliminates the disadvantages like its Noise Pollution it creates in Theatres and the disturbances caused by it in Hospitals due to its Electromagnetic waves radiation. The Prohibited areas are like the Theatres, Conference Halls, Hospitals, Airplanes and Parliament etc. In these places there will a common board or a watch keeper who will be asking to switch Off the Cell Phones before you get inside. Our aim of the project is to automatically avoid the use of Cell Phones in prohibited areas without any manual help. The paper uses the principle of Hand-Off Mechanism to disable the use of Cell Phone. Here no external circuitry is added to the Handset, But the Electromagnetic waves are emitted. In another method which has been simulated using MATLAB need external circuits to the Cell Phones which uses the CDMA technique, Here no Electromagnetic waves are liberated as well as the sound is muted. This is a new idea invented by us and it will be useful practically and commercially.

I. INTRODUCTION

In Theaters and Restaurants where people come for leisure and for peace gets affected by noise pollution by the Cell Phone users, where they talk loudly which creates annoyance to others. So my project is to unblock the Cell Phone users in these areas. Here we consider only the noise pollution and the Electromagnetic waves liberated by the Cell Phones do not care us. So there is no need of adding external circuitry to the Handset. We can just use the principle of Hand-Off Mechanism used in Cellular communication and unblock the user to use his handset.

But in the places like Hospitals and the Airplanes the Electromagnetic waves radiated from the Handsets cause disturbances. In Hospitals the EEG, ECG, and EMG etc., are affected by the Electromagnetic waves radiation. In Airplanes the EMW radiated from Handset causes disturbances in the radio frequency used for communication between the Airplanes and the ground control station. So here we add an external circuitry to the Handset and by adding a unique code word we stop the radiation. As this method involves adding external circuit, we have simulated this method using the Matlab Simulink Tool Box and presented in the Floppy.

II. PRACTICAL IMPLEMENTATION

As this method needs no external circuit we have implemented this practically using Antenna Trainer Kit. The principle behind this method is very simple.

A. Handoff Mechanism

According to the Handoff Mechanism used in mobile communication when the Handset moves from one base station to another base station the handset responds only to the base station which is nearer to the handset and the base station that radiates maximum power. So the handset tries to communicate with the new base station by radiating maximum power and tries to register its Identification code and the Paging Number with the new base station. It neglects the previous base station and in the previous base station the Identification code and Paging number of the handset is erased. This is basic principle behind the Handoff Mechanism.

B. Disabling the Handset

We use the Signal Strength based (RSS) Handoff Mechanism and disable the handset. We set up a Dummy Transmitting antenna which has the same frequency of the Cell Phone Receiving Frequency that is from 935-960 MHz (Since we use the standard GSM in mobile communications). We fix this dummy transmitting antenna at the entrance of any prohibited areas. When the Handset crosses this setup it will think that it has entered into a new base station as we generate the same frequency generated by the base station. So it will try to communicate with the Dummy Transmitting antenna thinking it as a new base station and it will neglect the previous original base station and it will be going on trying communicating with this Dummy Transmitter antenna and it will not accept the original message signal from the previous base station. So it gets cheated and no calls will be accepted, so even if the user have not switched off the handset they will become unusable as no calls will be received.

When the Handset goes out of the range of the dummy transmitting antenna it will again connect to the original base station and works as usual.

Note

We can also setup a Dummy Receiving Antenna and we can receive the radiations from the handset and give it to Alarm System or give it to a loud speaker and announce the user to switch Off the Handset and come inside and just we remember users.

III. DIFFICULTIES ENCOUNTERED IN THIS METHOD

High investment in setting high frequency antennas with medium range of power.

The radiation from the antenna should reach every corner of the prohibited area, so we have to set up many dummy transmitting antennas at regular intervals.

The radiation from the dummy transmitting antenna can also affect the Handsets which are outside the prohibited areas.

It can be used only in Theatres, Restaurants, and silence zones where the only the Noise pollution matters, But the Electromagnetic waves are always radiated from the Handset, so it cannot be used in Hospitals and the Airplanes Where primarily the Electromagnetic waves radiated from the transmitting oscillator inside the Handset has to be stopped.

Suppose if we are in the theatre and the Handset is disabled then all the Calls arriving during this time is missed and the calls are not registered in the Handset as Missed Calls, so we may miss some important calls.

we add simple hardware circuit inside the Handset, we can stop both the Electromagnetic radiation and the Noise Pollution and even we can register the Calls in the Handset as Missed Calls.

Disabling by adding external hardware circuitry

Here we should add external hardware circuit inside the cell phone so this is shown and stimulated using Mat lab Simulink Toolbox.

IV. PRINCIPLE

We use a fixed frequency as 900MHz and a Unique Code Word Generator. We multiply both of these using a Balanced Modulator. Then we fix this setup at the entrance of the prohibited area and radiate using a very low power Dummy Transmitting antenna. This is the outside setup.

Inside the Handset we have the same setup. We have a constant frequency generator set as 900MHz as from the transmitter antenna and a Unique Code Word Generator (Both the Unique Code Word both generated inside the Handset and the from the Dummy Transmitting Antenna should be same and it is fixed as there is no security needed in this system), the generated frequency and the Unique code word is multiplied using a Balanced Modulator.

Both the signals generated inside the Handset and the received frequency from the dummy receiver antenna is compared inside the Handset and if both signals are equal, then switch or a contact (Similar to Relay) is removed from

the Transmitting frequency oscillator and the Speaker inside Handset and the contact is given to the ground so that there is no Electromagnetic Radiation and no Noise Pollution.

If we come outside again then again the signals are compared and automatically the contact is replaced to the original position. So now the Handset comes to the normal working condition.

If it is an original message the unique code word will not be modulated with it so the comparator inside the Handset will neglect the signal and the calls will be registered as Missed Calls so we can know who have tried to contact us.

Let the output from the Unique code word generator be $u(t)$ (The Unique Code word generator must be same both in the Handset and the Dummy Antenna Setup).

So the output from the Balanced Modulator to the Comparator be $m_2(t) = f(t) * u(t)$

If $m_1(t) = m_2(t)$ then the switch will remove the contact from the Transmitting oscillator and the speaker inside the Handset, so we cannot speak using the Handset.

If $m_1(t) \neq m_2(t)$ (That is in normal message signal there will be no unique code word) so the signals will not be equal but the Handset will register the calls as Missed Calls, where it is used to contact further.

When we again we cross the Dummy Transmitter setup then again the condition will be $m_1(t) = m_2(t)$, so the contact comes to the original position thus enabling the Transmitting oscillator and speaker inside the Handset, so the Handset works as usual.

V. ADVANTAGES IN ADDING EXTRA HARDWARE

The Calls are registered as Missed calls.

The cost is very less as the Dummy transmitting antenna need only about $5\mu w$ to $7\mu w$ power.

Both the Electromagnetic waves radiation and the Noise Pollution are prevented.

Since the power required is very less the radiations from the Dummy Transmitting antenna setup reaches only less area so the handsets outside the prohibited areas are not affected.

VI. CONCLUSION

Compared too many advantages by the cellular communication there are also like some pitfalls such as Electromagnetic waves emitted which cause more heart troubles and Noise pollution in the unwanted areas. My project's aim is to eliminate those pitfalls by low investment and using easy methodology. Thus by just adding a small hardware circuit we can provide this service to industries or in secured places during the restricted hours/timings.

VII. REFERENCE

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