CAR SPEED CONTROL USING BLUETOOTH

BLUETOOTH APPLICATION

ABSTRACT

In the current scenario the world is plagued by accidents which are primarily due to human errors in judgment and hence thousands of lives are lost. These accidents can be avoided if only there was a mechanism to alert the driver of approaching danger. This can be done by monitoring the distance between nearby cars and alerting the driver whenever the distance becomes too short. This is precisely the aim of this paper. In this paper we propose the use of Bluetooth Technology by which we can check the speed of the car whenever it comes dangerously close to any other vehicle up front, thereby saving very many lives.

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INTRODUCTION

Since Bluetooth devices are capable of communicating with eight other devices simultaneously we can monitor and check the speeds of up to eight cars simultaneously, thus preventing accidents. Thus if we have two Bluetooth enabled devices in two cars the devices automatically communicate with each other when they come in the range of up to 100 meters of each other. The range is dependant on the power class of the product. Power transmission rates vary in many Bluetooth devices depending upon the power saving features available in a particular unit, bandwidth requirements, transmission distance. The statistics of road accidents is tremendous and highlights the need for such a system. The following is a statistic on the number of road accidents occurring each year.

ROAD ACCIDENT STATISTICS OF INDIA 1970-2003

Sl.No.	Year	Total No. of Road Accidents (in numbe rs)	Total No. of Persons Killed (in numbers)	Total number of Registered Motor Vehicles (in thousands)	No. of Accidents per ten thousand Vehicles	No. of Persons Killed per ten thousand Vehicles
1	**2**	**3**	**4**	**5**	**6**	**7**
1	1970	114100	14500	1401	814.42	103.50
2	1980	153200	24000	4521	338.86	53.09
3	1990	282600	54100	19152	147.56	28.25
4	1991	295131	56278	21374	138.08	26.33
5	1992	275541	60113	23507	117.22	25.57
6	1993	284646	60380	25505	111.60	23.67
7	1994	325864	64463	27660	117.81	23.31
8	1995	351999	70781	30295	116.19	23.36
9	1996	371204	74665	33786	109.87	22.10
10	1997	373671	76977	37332	100.09	20.62
11	1998	385018	79919	41368	93.07	19.32
12	1999	386456	81966	44875	86.12	18.27
13	2000	391449	78911	48857	80.12	16.15
14	2001	405637	80888	54991	73.76	14.71
15	2002	407497	84674	58924	69.16	14.37
16	2003	406726	85998	67033	60.68	12.83

Source: Data received from States/UTs.

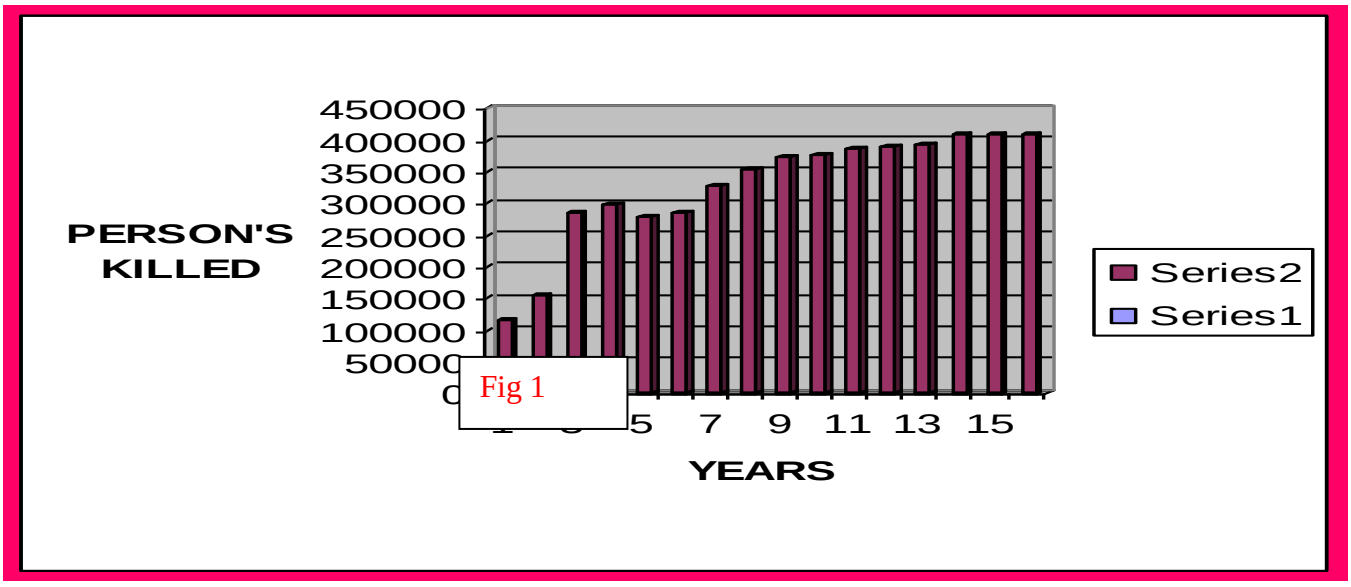

Fig 1

Because of traveling at high speeds there is a possibility of having accident. The figure 2 shows that when two cars or more come

within the distance of 10 km at high speeds there is a possibility of having accidents. The Bluetooth radio is a short distance, low power radio operating in the unlicensed spectrum of 2.4 GHz and using a nominal antenna power of 20 dBm.

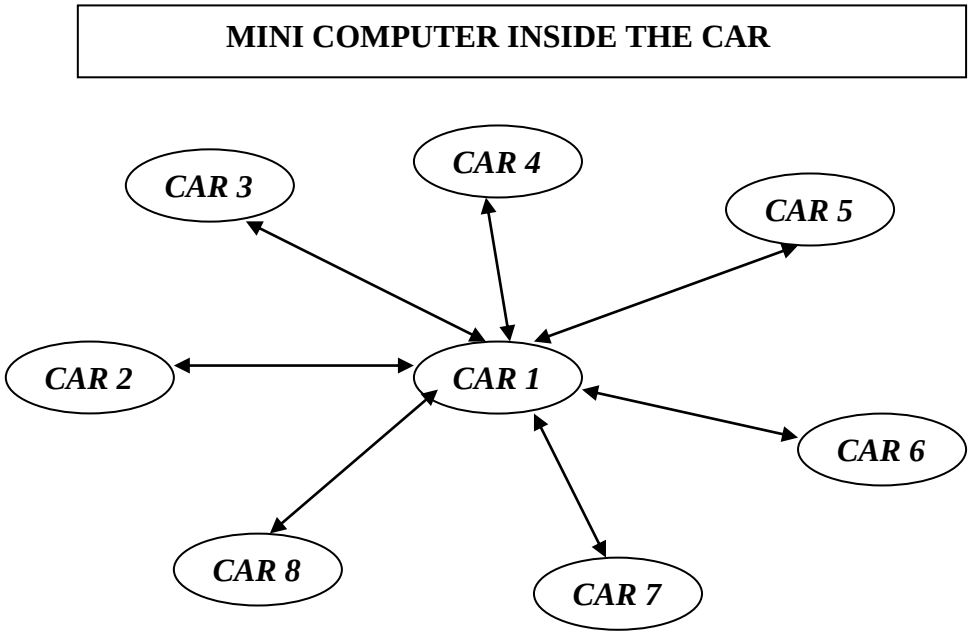

Fig 2

At the 20 dB the range is 100 meters, meaning equipment must be Within 100 meters to each other (about 328 feet) to communicate using the Bluetooth standard. With the help of this technology we can send data to the eight devices. The group of eight devices is known as piconet. Here we have a piconet and a scatternet, in the piconet M is the master and S1 to S7 are the slaves

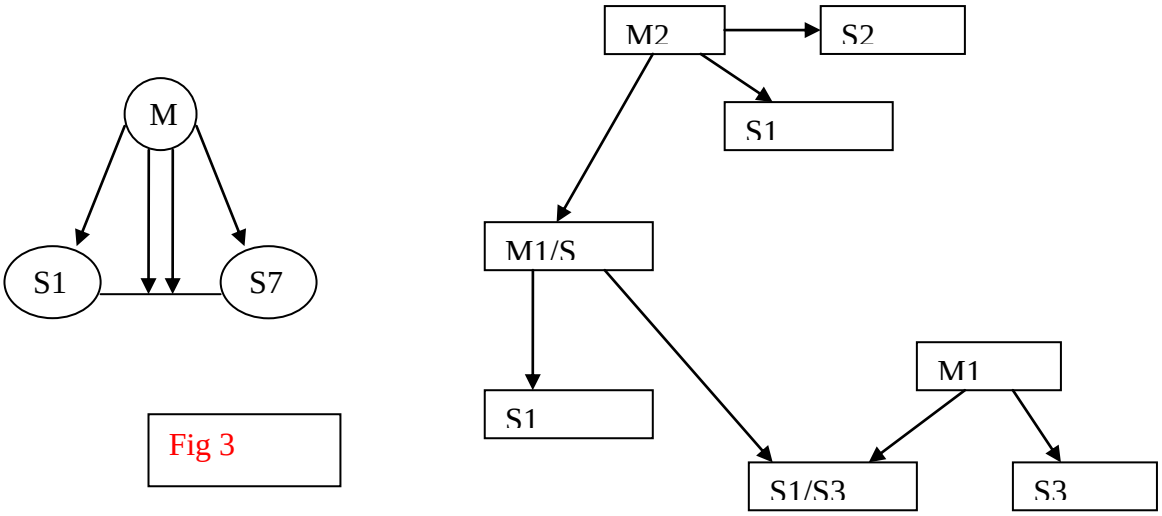

Fig 3

Radio communication is subjected to noise and interference, as the 2.4 GHz frequencies are shared between the all device in piconet. So the Bluetooth specification has solved this problem by employing what is called as spectrum spreading, in which the Bluetooth radio hops among different frequencies very quickly. There are 79 hops starting at *2.402* GHz and stopping at ***2.480*** GHz, each of which is displaced by 1 MHz. The Bluetooth avoids interference by hoping around these 79 frequencies 1600 times per second. So in order to avoid it we use bluetooth equipped car, in which each car have bluetooth transmitter and receiver. And the every car should have mini computer to monitor the relative position of the car with the other car.

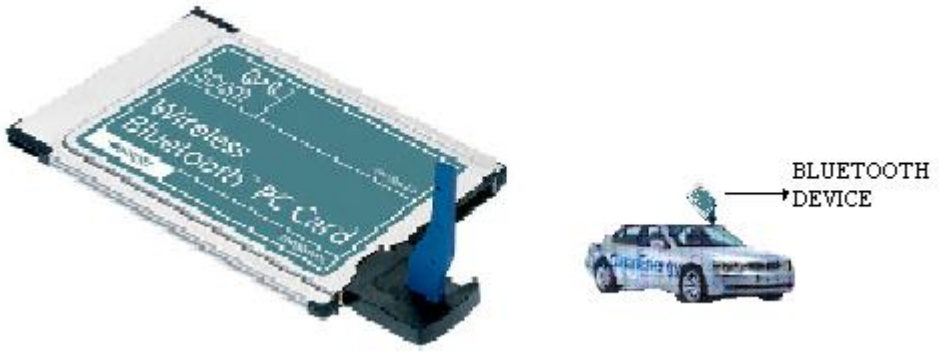

Fig 4

When any car comes close together bluetooth device sends warning signal to the car. Based on the type of warning signal received the computer sends signal to the brake control system to slow down the speed of the car. There are two types of control signals. First type of

signal control the speed of the car and the second type of signal is to overtake the car which is moving forward.

SCHEMATIC DIAGRAM OF CAR:

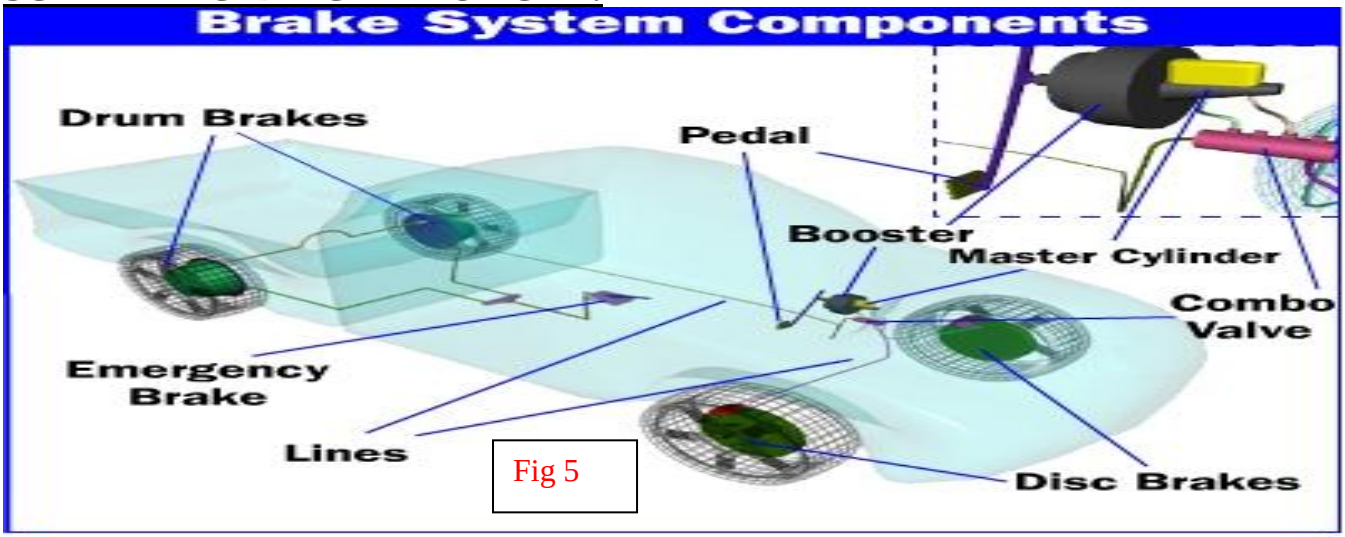

Fig 5

AUTOMTIC BRAKE SYSTEM:

The automatic brake system is the next generation braking system for controlling the speed of the car. On receiving the control signal from the traveling car the computer inside the car manipulates the signal and gives control signal to the braking system.

There are four main components to an automatic braking system:

- **speed sensors**
- **pump**
- **valves**
- **controller**

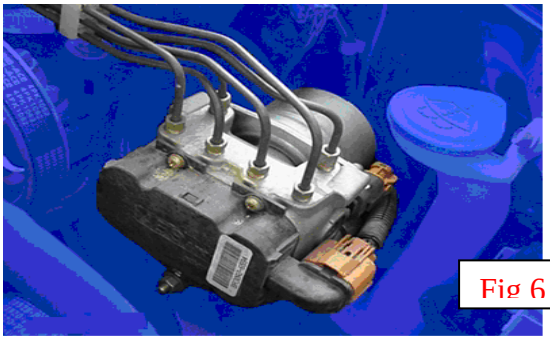

Fig 6

Automatic ***braking pump and valves***

The computer constantly monitors the distance between each of these cars and when it senses that the car is getting too close it moves the hydraulic valves to increase the pressure on the braking circuit, effectively increasing the braking force on the wheels. If the distance between two vehicle is within the 100m the Bluetooth devices get enabled and if the distance come closer within 10m the automatic

braking system takes the control. After the speed of the car is reduced and distance increased the hydraulic valves decreases the pressure on the braking circuit, thus effectively decrease the braking force on the wheels. The following steps show the various functions of the hydraulic valves:

- in position one, the valve is **open**; pressure from the master cylinder is passed right through to the brake.
- in position two, the valve **blocks** the line, isolating that brake from the master cylinder. This prevents the pressure from rising further should the driver push the brake pedal harder.
- in position three, the valve **releases** some of the pressure from the brake.

REPRESENTATION OF OUR IDEA

In the figure 7 when car A and car B come within the range of 100m both the Bluetooth devices get enabled and if any one of the car comes too fast then the bluetooth device sends a warning signal to the other car and it processes the signal and gives it to the automatic braking system.

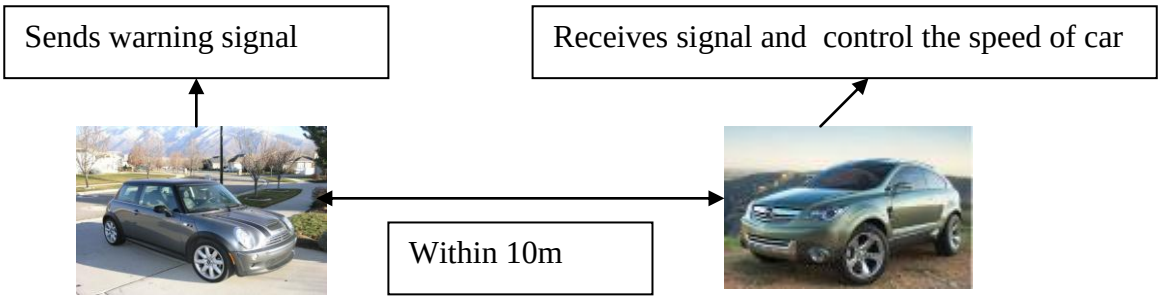

Fig 7

CONCLUSION:

The Bluetooth technology is being widely adopted by the Industry leaders. The possibility for new applications is very exciting with this Versatile technology. It provides a simple, logical answer to all the Problems-which is built a single common radio into every mobile computer, then neither do companies have to worry about WAN, nor do communication companies need to worry about building external cables. The Bluetooth communication device will thus be a small, low powered radio in a chip that will talk to other Bluetooth enabled products. Bluetooth has been designed to solve a number of connectivity problems experienced by the mobile workers & consumers. Thus, this technology helps make the electronic

devices more user friendly and helps address various other problems like accidents.