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Avoid animal accident occure by trains and vehicles

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ABSTRACT

The paper here, avoid the animal to come on road/rails and in affect avoid the death due to accidents. Avoiding such accidents are the social problems So an intelligent electronics system is necessary which can be affixed to avoid the possibilities of accidents. There are various systems available to avoid such collision or accident. It is basically alarms vehicle driver in a signal form. Basic idea behind the paper is to generate the sound signal which can be inaudible to human and irritating for animals. Such instrument can be mounted on pole nearby the road/rails having animal traffic which may be towards jungle/home.

Keyword: ***- Intelligent electronics system, alarms, sound signal, inaudible sound, irritating signal***

1. INTRODUCTION

Every animal or group of animal is having a specific range of hearing frequencies. There irritating frequency is estimated by a specific logic and is adjusted by trial and error methodology. Irritating frequency generator of a specific loudness is designed in addition with some intelligent operations to sense the traffic of animals. This system can detect the animal and warn them at their audible frequency spectrum. Basic idea is every animal have sense of unknown threat. Animal can hear at specific frequencies. In proposed system we tried to find such frequencies and used it to avoid collision or accident. This resulting to decreasing the population of wildlife, so there are various ways to search how to minimize incidences and save the wildlife. Similarly it is heard about the various accidents of domestic animals like buffalo, cow and nilgai etc. Avoiding such accidents are the social problems. Basically on specific spots the accidents occurs. So, an intelligent electronics system is necessary which can be fixed to avoid the possibilities of accidents.

2. LETURATURE REVIEW

System proposed here is to avoid the animals to came on road/rails and in affect avoid the death due to accidents. To minimize the incidences of wild animal-vehicle collision along the state route, [1] proposed the system. Wild animal-vehicle collisions generally occur more at night, on dry road conditions and by larger vehicles

.So The ability to avoid a collision is reduced in all these situations due to reduced visibility and increased stopping distances [2]. According Wildlife Protection Society of India [3] always reported animals killed in Road and Train Accidents in India as follow:

Table 1: Animals killed in Road Accidents in India

Animals killed in Road Accidents in India (in last 6 months)		
Sr. No.	**Animal Name**	**Killed Nos.**
1	Spotted Deer	7
2	Hyena	3
3	Leopard	20
4	Leopard cat	1
5	Rusty spotted cat	1
6	Sambar	3
7	Tiger	2

Table 2: Animals Killed in Train Accidents in India

Animals killed in Train Accidents in India		
Sr. No.	**Animal Name**	**Killed nos.**
1	Bison	4
2	Nilgai	3
3	Crocodile	1
4	Deer	1
5	Elephant	13
6	Leopard	4
7	Vultures	55

There has been very little scientific research conducted on the perception and behavioral response of white-tailed deer to sound. As a preliminary step towards developing an understanding of hearing abilities of deer, auditory brainstem response tests were conducted on captive deer at the University of Georgia's Whitehall Captive Deer Research Facility [4]. The Supreme Court have banned vehicles in forests for the animal safety [5]. Concerned by high animal mortality in traffic accidents on roads passing through thick forests, the Supreme Court on issued notices to the Centre and 10 states asking why mitigating measures, including a dusk-to-dawn ban on vehicles on forest roads, be not taken immediately. In another case Railways, environment ministry differ on slowing trains in tiger area[6]. After a tiger died on being run over by a passenger train on the Gondia-Chandrapur track on April 14, the ministry of environment and forests (MOEF) has said that it has been decided to restrict the speed of trains to 40 kmph on this route. However, the railways say that the drivers will take extra care to spot wildlife movement and react, though the trains would travel at the regular speed. Similarly, 2 buffaloes hurt in train accident slaughtered, claim animal activists [7]. Pattaravakkam railway station near Ambattur on the Chennai Central-Tiruvallur section a group of seven buffaloes crossing the railway tracks was allegedly struck by a train at Pattaravakkam railway station near Ambattur on the Chennai Central-Tiruvallur section on 4 sep. 2013. Again one incident occurred Lion cub run over by train in Gujarat [8]. A lion cub died was killed after being hit by a goods train in Gujarat's Amreli district on 12 may 2014.

Collisions with animals can have many negative consequences:

- Injury to, or death of, vehicle occupants
- Loss of valuable livestock or pets
- Harm to endangered species
- Vehicle damage
- Economic losses (cleanup, repairs to vehicles, etc.)
- Decrease in enjoyment of a tourist holiday due to frequent road kill encounters.

To save the wildlife from a specific accident, a project is presented here to generate the hearing frequency for the specific animal. The animal can alert with the signal of danger and can run away from that place like road, railway track etc. resulting in accident avoidance. Each animal has his own audible range of frequency spectrum and not all kind of animals found everywhere. However we observed this fact with keen interest and proposed the system which can detect the animal and warm them at their audible spectrum. The behavioral response of specific animals to hearing may depend on the type of sound emitted. Pure tones are single frequency, continuous sounds at equal intensity. Complex sounds resemble sounds occurring in nature (i.e., deer vocalizations) [4] and are composed of two or more pure tones of different frequencies that are generated simultaneously and repeated over time. We proposed the system for identification of traffic on road and according to it the animals hearing signals are generated for their irritation due to which the animal run away out of road site. Two camera are use to analyze the road traffic. If traffic is there on road the system horns the ultrasonic signals for the specific animals so that frequent accident can be avoided. Camera scanning and object recognition using ARM 7, signal generators and power amplifiers for

driving the Twitter Horns with specific loudness are used in this work. We surveyed the various hearing frequencies for various animals and particular animal are decided like dogs, cats, bullocks/cows and horses.

3. METHADOLOGY

3.1 HEARING RANGES OF ANIMALS

The following Table 3 shows the minimum and maximum hearing frequency ranges of the different species. Any attempt to assess the effects of sounds on animals must consider species differences in hearing abilities. Although the hearing ranges of most species overlap to a large degree, considerable variation occurs in high- and low-frequency hearing as well as in absolute sensitivity. As a result, a sound that is easily audible to one species may be less audible, or even inaudible, to another.

Table 3: Hearing Frequency ranges of different animals

Species	Approximate Range (Hz)	Species	Approximate Range (Hz)
Dog	67-45,000	Hedgehog	250-45,000
Cat	45-64,000	Raccoon	100-40,000
Cow	23-35,000	Ferret	16-44,000
Horse	55-33,500	Opossum	500-64,000
Sheep	100-30,000	Chinchilla	90-22,800
Rabbit	360-42,000	Elephant	16-12,000
Guinea pig	54-50,000	Tiger	20-65000

3.3 COMMUNICATION BETWEEN ANIMAL SPECIES

Since animals use their acoustic and vibration senses both to monitor their environment and to communicate with other animals of the same species, we should expect that natural selection has optimized these sensing and sound production abilities. One particular obvious optimization is to maximize the range over which they can communicate with others of the same species [9]. Simple observation shows that small animals generally use high frequencies for communication while large animals use low frequencies [10-14].

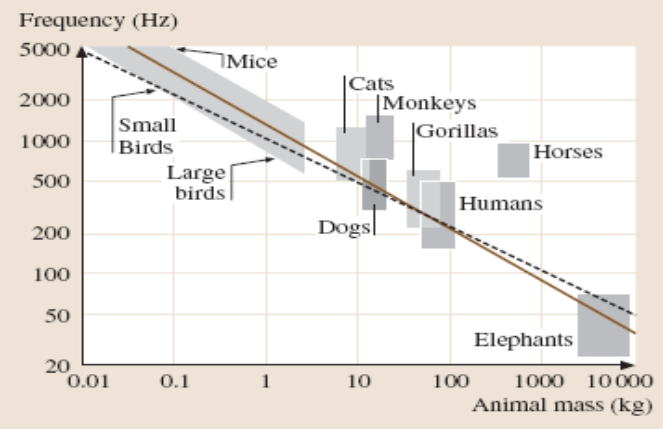

Fig. 1: Relation between animal mass and hearing frequency range

The simplest assumption is that the frequency is determined simply by the physical properties of the sound-producing mechanism. For a category of animals differing only in size, the vibration frequency of the sound-producing organ depends upon the linear dimensions of the vibrating structure, which are all proportional to the linear size L of the animal, and upon the density ρ and elastic modulus E of the material from which it is made [9-11].

Elephants represent an interesting extreme animal in the world because of their very large mass as much as 10 tones. Their calls, which have a fundamental in the range 14–35Hz, can have an acoustic power as large as 5W, leading to a detection distance as large as 5 km, or even up to 10 km after sunset on a clear night [9,12].

Some existing system has animal detection and driver alert message system. Some are using sensor based image processing and alert system. Such as Road Animal Detection [RAD], Using RADS [15], animals are detected entering the roadway which automatically triggers the warning device. Drivers are thereby alerted to the presence of animals on the roadway and can react in advance to avoid a potential accident. This system is used in United States of America and Canada now a day. The system is necessary in those countries because of some reasons like these developed countries the transportation the long road, highway, bridges, railway lines is constructed. This is made by cutting the forest so due to that the directly effect on wild life so that the system is developed to save the wild life from the accident held on road, railway crossing. The system is used in US is based on the digital image processing by using Embedded System. In this system there is one camera with embedded kit, the camera capture the animal image which is on the road and give light signal to the vehicle driver. The real view of the system used in United States of America and Canada is shown in Fig.2 and Fig. 3.

Fig. 2: The system arrangement on pole used on highway

Various steps of proposed method:

1 The system is based on 0the PIR sensor using ARM7 and audio frequency generator to run away the animal.

2 The system used PIR sensor detect the traffic motion which are travelling along the road.

3 At the same time, the motion is recognizing by the processor and it gives the ultrasonic signals to the audio amplifier.
4 Audio amplifier amplifies the frequency which is irritating to the animal those who come near the road.
5 Due to the audio signal, the animal ran away from the road and consequently there are minimum chances of accidents.

4. CONCLUSIONS

The research area in social aspects for wild animal death avoidance and accidents prevention. Animal specific frequency spectrum signal are generated. The experimental results are obtained for particular animal and it was successfully tested. The specific animal should be alert or alarm with signal of danger and he is run away from that place like road, railway track etc and it result to avoid the accident.

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