VIRTUALEYE-LIFE GUARD FOR SWIMMING POOLS TO DETECT ACTIVE DROWING USING IBM CLOUD

UG PROJECT PHASE-1 REPORT

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IN

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Submitted by

ALLA AKHILA	**19UK1A0519**
PALAKURTHI NITHIN	**19UK1A0521**
KUDURUPAKA ANUSHA	**19UK1A0555**
SUSMITHA UPPULA	**19UK1A0523**

Under the esteemed guidance of

Mr. N. Sravan Kumar

(Assistant Professor)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VAAGDEVI ENGINEERING COLLEGE

(Affiliated to JNTUH, Hyderabad)

Bollikunta,Warangal-506005

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
VAAGDEVI ENGINEERING COLLEGE
BOLLIKUNTA, WARANGAL –506005

2019-2023

CERTIFICATE OF COMPLETION UG

PROJECT PHASE-1

This is to certify that the UG Project Phase-1 entitled "**VIRTUALEYE-LIFE GUARD FOR SWIMMING POOLS TO DETECT ACTIVE DROWING USING IBM CLOUD**" is being submittedby **A.AKHILA(H.NO:19UK1A0519),U.SUSMITHA(H.NO:19UK1A0 523),P.NITHIN(19UK1A0521),K.ANUSHA(19UK1A0555)** in partial fulfilment of the requirements for the award of the degree of Bachelor of Technology in Computer Science and Engineering to Jawaharlal Nehru Technological University Hyderabad during the academic year 2022-2023,is a record of work carried out by them under the guidance and supervision.

Project Guide   **Head of the Department**
Mr. N. Sravan   **Dr. R. Naveen Kumar**
(Assistant professor)   (Professor)

External

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ALLA AKHILA   **(19UK1A0519)**
UPPULA SUSMITHA   **(19UK1A0523)**
PALAKURTHI NITHIN   **(19UK1A0521)**
KUDURUPAKA ANUSHA (19UK1A0555)

ABSTRACT

Every year, many individuals, including kids under the age of 5 drown in the deeps of the swimming pool, and the lifeguards are not well trained enough to handle these situations. Thus arises the requirement for having a system that will consequently detect the drowning individuals and alarm the life guard at such risk. Swimming pool surveillance systems plays an essential role in safeguarding the premises. In this project differential pressure approach is used for detection of drowning incidents in swimming pools at the earliest possible stage. The children's life is saved during drowning incidents in the swimming pool by lifting the acrylic plate. The proposed approach consists of RF module, Pressure Sensor and Motor Driver. The demo system based on pressure sensor has an advantage of convenience, cost saving and simple algorithm.

Key Words: RF module, ATmega32 Microcontroller, Acrylic plate, Pressure sensor, Motor driver.

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A Source Code

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1.INTRODUCTION

1.1 Overview

Virtual Eye is a computer vision detection system for the prevention of drowning incidents in swimming pools .Virtual Eye works like an "extra lifeguard" under the water of your pool. Our object recognition software tracks the movements of all swimmers in a pool. And in the event of a serious drowning incident ,Virtual Eye will provide an alarm to pool lifeguards. This will help lifeguards improve their reaction-time, as they initiate a rescue . The live video stream from our underwater cameras is automatically monitored by our "state-of-the-art" object recognition software .When Virtual Eye detects a swimmer in distress on the bottom of the pool, it will raise a radio alarm to pool lifeguards and an visual alarm to our Monitoring & Control Station. Lifeguards can visually assess the developing situation within seconds of the event first occurring, and initiate their rescue procedure when necessary.

1.2 Purpose

Every year, many individuals, including kids under the age of 5 drown in the deeps of the swimming pool, and the lifeguards are not well trained enough to handle these situations. Thus arises the requirement for having a system that will consequently detect the drowning individuals and alarm the life guard at such risk. Swimming pool surveillance systems plays an essential role in safeguarding the premises. In this project differential pressure approach is used for detection of drowning incidents in swimming pools at the earliest possible stage. The children's life is saved during drowning incidents in the swimming pool by lifting the acrylic plate. The proposed approach consists of RF module, Pressure Sensor and Motor Driver. The demo system based on pressure sensor has an advantage of convenience, cost saving and simple algorithm.

2.LITERATURE SURVEY

2.1 Existing problem

Swimming pool drowning monitoring system based on video technology is mostly reported in the literature. There are three kinds drowning monitoring system according to the different position of the camera. One is that the camera is mounted on the underwater swimming pool wall, then monitor underwater swimmer status. A limitation of this equipment is that if too many swimmers, the occlusion problem arises. The other is that the camera is mounted upon the water, and monitors the Swimmer posture change. The reflection and refraction of light in air-water interference will affect the image quality, and drowning man feature this method detected is not easy to distinguish swimmers and divers obviously.The third is a combination of the two, underwater camera and aerial camera matched, monitoring the swimmer posture. This system needs constant observation which is the main disadvantage.

2.2 Proposed solution

The automated drowning detection system works on the principle of differential pressure. The system contains two fundamental modules: to begin with, the wristband consisting of pressure sensors on the transmitter side. Second, the receiver module at the swimming pool site. The children entering the pool territory should wear the wristband. The Pressure at underwater is different and greater than the pressure at the air - water interface. The pressure at a particular depth is measured and set as the threshold. Once the child gets into the pool, the pressure is continuously measured and monitored by the microcontroller. When the current value surpasses the threshold limit an alerting signal is sent to the receiver. The wireless transmission and reception of signals is done through RF module. On receiving the valid signal microcontroller sets the buzzer ON, turns ON the motor

driver which in turn lifts the acrylic plate of the multifloored swimming pool. The kid is brought to air-water interface, i.e.the top level of swimming pool by the acrylic plate.

3.THEORITICAL ANALYSIS

3.1 Block diagram
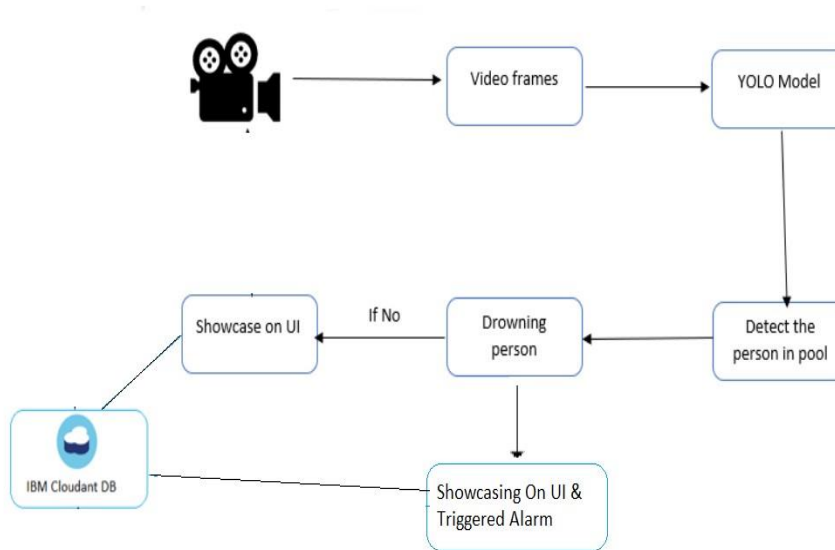
3.2 Hardware and Software designing

To complete this project, you must require the following software's, concepts, and packages. Anaconda Navigator is a free and open-source distribution of the Python and R programming languages for data science and machine learning related applications. It can be installed on Windows, Linux, and macOS. Conda is an open-source, cross-platform, package management system. Anaconda comes with so very nice tools like Jupyter Lab, Jupyter Notebook, QtConsole, Spyder, Glueviz, Orange, R studio, Visual Studio Code. For this project, we will be using Jupyter notebook and Spyder.

4.EXPERIMENTAL INVESTIGATION

The dominant devices of the virtual eye contacts are the cameras (Web-cams are used in general) in the virtual platforms. Besides, live screen parts on the monitors are as important as Web-cams as mentioned before. These two parts generate synchronous virtual eye contacts to be used together with the Internet lines. When using a camera, the screen size, framing of the instructor during shooting, location of the camera, camera height and picture quality effect generating of virtual eye contacts in virtual classroom environments.

There is three important parts on the monitor screen in virtual classroom platforms at the learner side as mentioned. These are presentation screen, live screen and chat-box part. Because of dividing one monitor screen at least these main parts, there is a small place for live screen part. (Generally presentation screen parts take the largest part of the monitor screen because of helping to be explained content parts which cover slide shows, animations, images, written questions or taped motion pictures.) Besides, there is an aspect ratio of the live screen parts like the other parts. The traditional aspect ratio is 4:3 which means 4 wide by 3 high in TV screens. HDTV's aspect ratio is 16:9. Since there is a live and motion image on it, virtual classroom platform producers tend to use the traditional aspect ratios because of the familiarity of the users from the television screens.

On the other hand, there are always minor aspect ratio and pixel count differences between software programs (Kerlow, 2004). Live screen takes part with a definite aspect ratio in a small part of the client's monitor. Some virtual classroom platforms allow making the live screen larger; but it does not cover full screen because of the importance of the other screen parts of the virtual classrooms.

This criterion affects framing of the instructor in front of the camera. This communication worker is generally sitting during the virtual classroom. meetings, because she/he uses his or her mouse or keyboard to control and change the content parts or interact with the distance learners both verbally or text-based. Close-up

shots or medium close-up shots of the instructor may probably the most appropriate shots for producing virtual eye contacts.

Close-up shot of a person refers just above head to upper chest and medium close-up refers cutting of a body at lower chest (Millerson, 1985). It is possible to see the eyes of the instructor easily for distance learners with these shots. If the framing of that person becomes larger, the head and the eyes will become smaller and because of the small size of the screen, virtual eye contact will not occur.

Location of the camera is also critical because of two different situations. First, the instructor must look at the camera directly to generate virtual eye contacts with the distance learners during the synchronous meetings. Second, there are always important materials like content parts or warnings about a client's question or comment on the monitor. Besides, controlling the presentation screen, changing the content parts and answering the clients are some of the responsibilities of the instructor. (They can have assistants to share controlling or changing responsibilities in the platforms, if they want.) She/he performs these responsibilities on his or her monitor.

If the instructor can see the monitor and look at the camera at the same time, this point of view provides the best solution in the virtual classrooms. This point of view can be achieved if the camera is located nearly above or below of the monitor. With a clear distance from the monitor about one or one and the half meters, the instructor can see these two items.

 Moreover, his/her looking at the camera dominantly and gazing at the monitor with the borders of the point of view help him or her during a meeting when there is a need of virtual eye contact generation. (This situation is explained more clearly in the fallowing parts of the article.)

Location of the camera highlights the height of the camera. As the instructor sits down on a chair in front of the monitor, the camera should be located nearly at the eye level of the instructor. The eye level position can be fixed with raising or lowering the height of the monitor depending on the camera's position being on the top or down of the monitor. Being the upper side or the lower side of the camera from the eye level does not affect the virtual eye contact.

However, it affects the perceiving of the person in front of the camera and this may affect perceiving of the virtual eye contact indirectly. High shots (higher of the camera20° from the eye-line) can make a subject appear weak, unimportant and inferior (Millerson, 1985).

A person seems to lack the authority with these kinds of shots. This situation affects the reliability of the instructor. Low shots (lower of the camera 20° from the eye-line) make the people appear imposing, threatening and powerful (Millerson, 1985). Threatening position also provides a barrier between the instructor and the distance learners. Therefore, virtual eye contacts will be affected by these camera positions negatively. Eye level shots provide the best solution in the virtual classroom platforms.

The picture quality of the live image is another technical aspect in the side of the distance learners for generating virtual eye contact. Suwita, Bocker, Muhlbach and Runde (1997) state that picture quality of HDTV better than traditional television and there is not a difference between HDTV (High Definition Television) and traditional television for the distance partners in video conference applications about recognizing of non-verbal communications like gestures or postures. This criterion also provides guessing the picture quality of the live screens in virtual classroom platforms for the producers. If the image of the instructor can be seen clearly by the e-learners, this will be enough for generating virtual eye contacts.

There may be different shooting angles of the cameras or the Web-cams which provide the live images without generating virtual eye contact. These kinds of live images are also acceptable in the virtual classrooms. However, shootings with providing virtual eye contacts create further benefits for the distance learners.
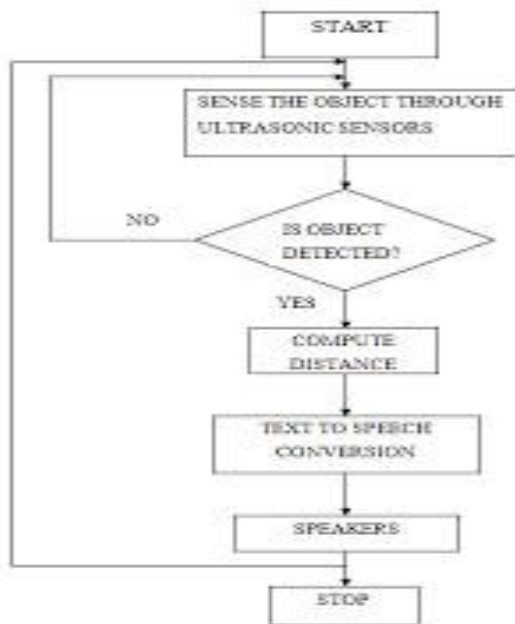
5.FLOWCHART

Fig. Flow chart of virtual eye

6.RESULT

we find that the virtual eye expression renders of sadness and anger generated from our model conveyed a significant level of emotional recognition to respondents. Surprise and happiness indicated no statistically meaningful proportional differences in perception. Finally, fear and disgust displayed an adverse level of perception however these scores could be improved with a higher fidelity of the main subtle cues that the audience uses to identify the emotions and conducting a more comprehensive survey which takes into account respondent's racial identity.

7.ADVANTAGES AND DISADVANTAGES

Advantages:

1.Potential benefits to patient safety and ethical acceptability.

2.Opportunity to assess trainee competence in a consistent and reproducible manner.

3.Low risk environment in which trainees can practice at any time.

4.Predictable availability regardless of external factors.

5.Emerging evidence of construct validity and transferability of simulator skills.

Disadvantages:

1.Nascent technology with imperfect fidelity.

2.Expensive to implement.

3.Limited evidence regarding optimal implementation within residency training.

4.Limited to certain procedures.

5.Current simulators only focus on developing technical skill and do not incorporate interaction with the rest of the intraoperative team.
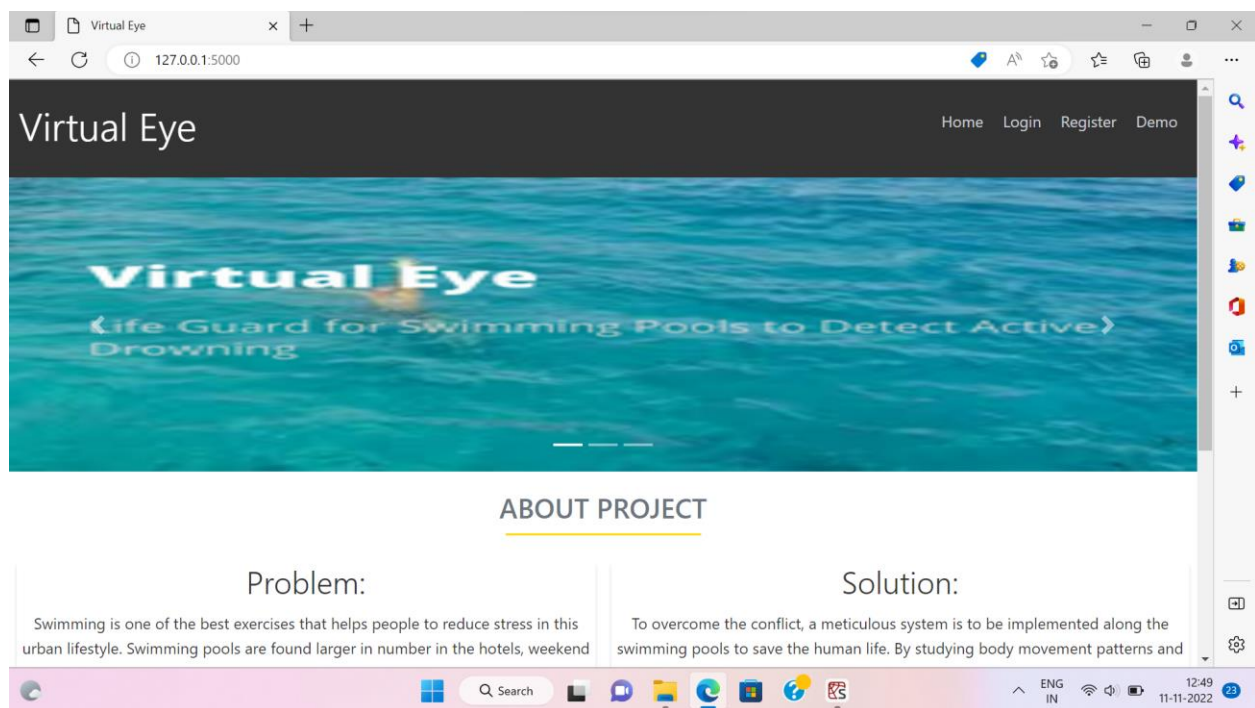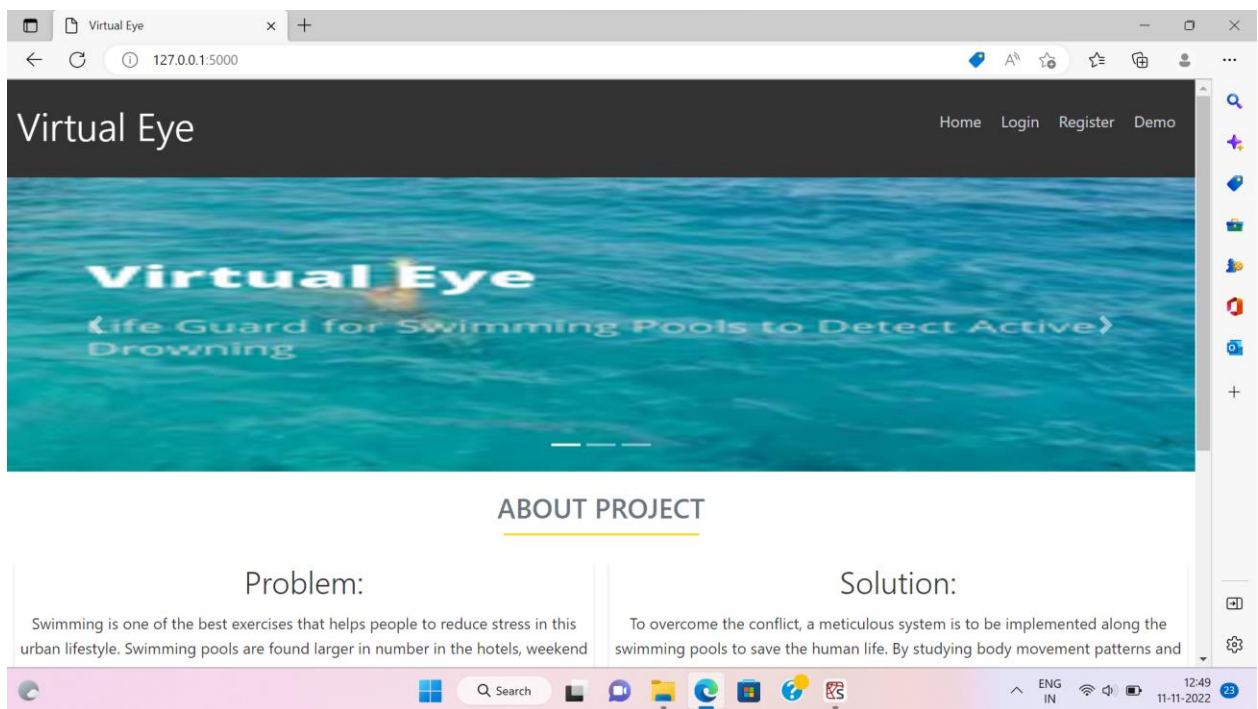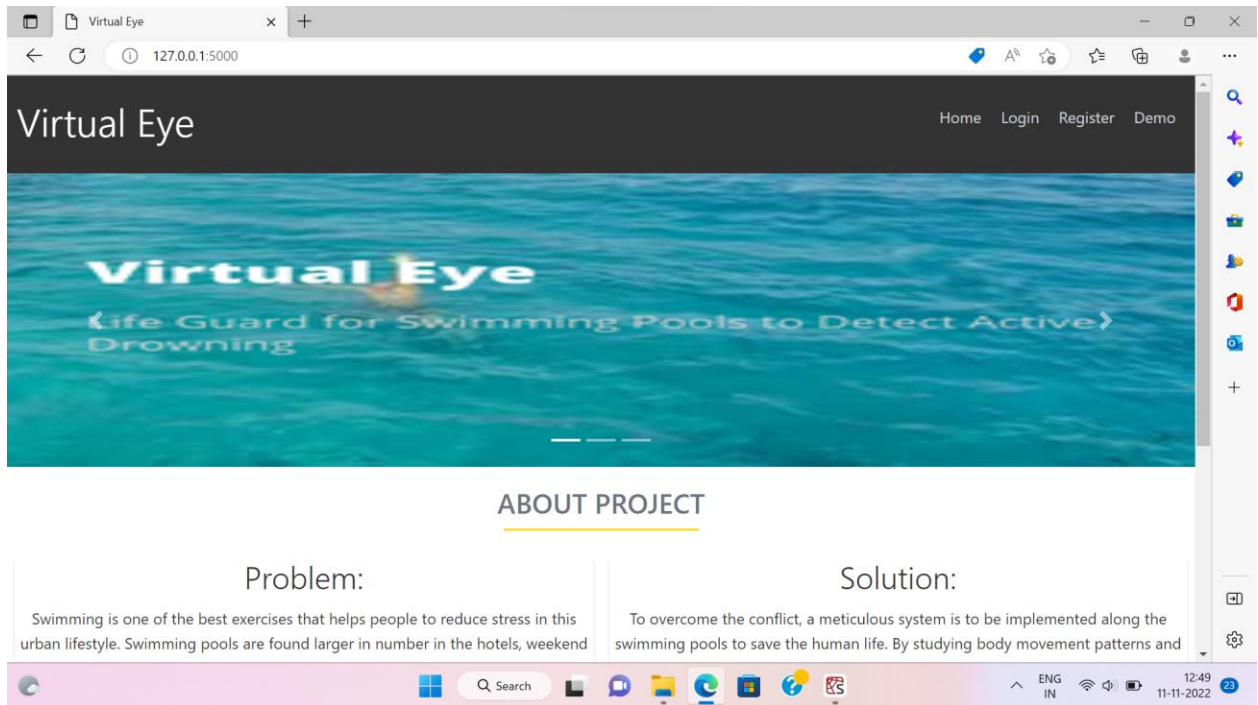
8.APPLICATIONS

-Perception

-Sonification techniques

-Training

-Sensor emulation and hardware integration

Output images:

Virtual Eye

Home   Login   Register   Demo

Virtual Eye
Life Guard for Swimming Pools to Detect Active Drowning

ABOUT PROJECT

Problem:

Swimming is one of the best exercises that helps people to reduce stress in this urban lifestyle. Swimming pools are found larger in number in the hotels, weekend

Solution:

To overcome the conflict, a meticulous system is to be implemented along the swimming pools to save the human life. By studying body movement patterns and

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9.CONCLUSION

Consistently numerous people, including kids, are suffocated or near suffocating in the deeps of the swimming pools, and the lifeguards are not prepared all around to deal with these issues. In this manner raises the necessities for having a framework that will thus recognize the suffocating people and alert the lifeguards at such hazard. It can be installed in International standardized schools where classes are held for training kids.

10.FUTURE SCOPE

Future work will be focused on enhancing the performance of the system and reducing the load on the user by adding the camera to guide the blind exactly. Images acquired by using web camera and NI-smart cameras helps in identification

of objects as well as scans the entire instances for the presence of number of objects in the path of the blind person. It can also detect the material and shape of the object. Matching percentage has to be nearly all the time correct as there no chance for correction for a blind person if it is to be trusted and reliable one. The principles of mono pulse radar can be utilized for determining long range target objects. The other scope may include a new concept of optimum and safe path detection based on neural networks for a blind person.

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