

# **VIRTUAL EYE – LIFEGUARD FOR SWIMMING POOLS TO DETECT ACTIVE DROWNING**

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## **ABSTRACT**

Children under six of their age are found to be suffering the highest drowning mortality rates worldwide. Such kinds of deaths account for the third cause of unplanned death globally, with about 1.2 million cases yearly. Beginners, especially, often feel it difficult to breathe underwater which causes breathing trouble which in turn causes a drowning accident Worldwide. Drowning produces a higher rate of mortality without causing injury to children. The lack of sufficient practice leads to difficulty in swimming and which paves a way to drowning. When the person slips off into the swimming pool unknowingly into higher depth then the person has a higher chance of drowning. The person feels difficulty breathing underwater which causes breathing trouble which in turn causes a drowning accident Worldwide. drowning produces a higher rate of mortality without causing injury to children. Swimming is one of the finest exercises which is a good practice for all age group people which regulates our body in many ways and keeps us healthy and fit. But due to the fear of drowning(which leads to death sometimes) most of the people are avoiding swimming. So this condition has to be turned down.

## **LITERATURE REVIEW**

[1] The system consists of a Raspberry Pi with the Raspbian operating system, a Pixy camera, an Arduino Nano board, stepper motors, an alarm system, and motor drivers. The proposed system is based on the colour-based algorithm to position and rescue swimmers who are drowning. The device then sends an alarm to the lifeguards. The model not only detects drowning but also tracks the swimmers. The system performed well during several experiments carried out in the laboratory.

[2] Using convolutional neural network (CNN) models, it can detect a drowning person in three stages (drowning detection, the rescuing drone, and the hazardous activity detection). Whenever such a situation like this is detected, the inflatable tube-mounted self-driving drone will go on a rescue mission, sounding an alarm to inform the nearby lifeguards. It identifies drowning victims in a minimum amount of time and dispatches an automated drone to save them.

[3] Using multiple sensor data in underwater human rescue detection systems to spot drifting and drowning people in a natural water ecosystem. The water flow sensor which is attached to the portable device calculates the drift distance and tracks a drowning person. The approach detected human drifting and drowning up to a range of 5m in water bodies. The final result achieved an average of 82.10% accuracy.

[4] The proposed system structure here consists of a Raspberry Pi (Single Board Computer) equipped with a USB camera for taking the live feed from the pool area. The system also covers the alerting phenomena using a buzzer so that necessary actions are taken intermittently without any delay. Alerting a drowning state is done without any delay here, GPIO system for alerting and short message service used in cohesion with a Raspberry Pi computer makes this possible.

## **CONCLUSION**

We provided a method to robust human tracking and semantic event detection within the context of a video surveillance system capable of automatically detecting drowning incidents in a swimming pool. In the current work, an effective background detection that incorporates prior knowledge using HSV colour space and contour detection enables swimmers to be reliably detected and tracked despite the significant presence of water ripples. The system has been tested on several instances of simulated water conditions such as water reflection, lightning condition and false alarms. Our algorithm was able to detect all the drowning conditions along with the exact position of the drowning person in the swimming pool and had an average detection delay of 1.53 seconds, which is relatively low compared to the needed rescue time for a lifeguard operation. Our results show that the proposed method can be used as a reliable multimedia video-based surveillance system.

## REFERENCE

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- [4] Video Based Drowning Detection System - Pavithra P, Nandini S,Nanthana A,Noor Tabreen Aslam, Praveen Kumar P