

# Life Guard for Swimming Pools to Detect Active Drowning

## **PROBLEM STATEMENT 1 :**

Drowning detection system that detects every dangerous situation and accident. The software works in close integration with the cameras installed in the pool to continuously scan the pool. Thanks to this combination of hardware, software and profound innovations.

## **PROBLEM STATEMENT 2 :**

When it comes to swimmers in trouble, every second counts. This project makes itself heard loud and clear in case of danger. The built-in notification system produces alarms within 10 seconds on smartwatches, phones, flashing lights and other configurable devices. In addition, its advanced technology can provide real-time location and image of the danger, making rescue operations easier.

## **PROBLEM STATEMENT 3 :**

The detect active drowning system is able to record all the activities in the pools and to classify critical situations from normal ones in order to keep track of what happened. Thanks to its advanced image archiving system. This project meets the legislative requirements for the protection of personal data.

## **PROBLEM STATEMENT 4 :**

The protection of swimmers is ensured to all facilities by a vigilance provided by personnel assigned to control the activities carried out in the pools. These controls have several critical points. The biggest problem is the difficulty in seeing the bottom of the pool. This project is specifically designed to provide support to lifeguards in the supervision of swimmers. It offers an additional level of safety and integrates seamlessly into rescue operations.

## **PROBLEM STATEMENT 5 :**

Aerial cameras cooperate with underwater cameras to improve the reliability of drowning detection by identifying the position of swimmers in the water, whether on the surface or underwater. In addition, the continuous recording functionality allows you to reconstruct the dynamics of any incident or event.

#### **PROBLEM STATEMENT 6 :**

The drowning detection system is based on this software, the result of 15 years of development and testing on hundreds of different pools installed in different areas of the world.

The scanning and modeling in 3 dimensions realized in real time by the software, allows the identification of the exact position of people in water, which is important to set off alarms even near the surface and not only the bottom of the pool.

#### **PROBLEM STATEMENT 7 :**

This project integrates a series of devices to promptly notify any kind of danger to the safety personnel. These include smartwatches that can provide the lifeguards with an image and position of the danger in real time, as well as handhelds, screens, LED panels, sirens and light systems.

#### **PROBLEM STATEMENT 8 :**

Safety in swimming pools is a crucial issue. A Safety in swimming pools is a crucial issue. In this paper, a real time drowning detection method based on HSV color space analysis is presented which uses prior knowledge of the video sequences to set the best values for the color channels. Our method uses a HSV thresholding mechanism along with Contour detection to detect the region of interest in each frame of video sequences. The presented software can detect drowning person in indoor swimming pools and sends an alarm to the lifeguard rescues if the previously detected person is missing for a specific amount of time. The presented algorithm for this system is tested on several video sequences recorded in swimming pools in real conditions and the results are of high accuracy with a high capability of tracking individuals in real time. According to the evaluation results, the number of false alarms generated by the system is minimal and the maximum alarm delay reported by the system is 2.6 sec which can relatively be reliable compared to the acceptable time for rescue and resuscitation. real time drowning detection method based on HSV color space analysis is presented which uses prior knowledge of the video sequences to set the best values for the color channels. Our method uses a HSV thresholding mechanism along with Contour detection to detect the region of interest in each frame of video sequences. The presented software can detect drowning person in indoor swimming pools and sends an alarm to the lifeguard rescues if the previously detected person is missing for a specific amount of time. The presented algorithm for this system is tested on several video sequences recorded in swimming pools in real conditions and the results are of high accuracy with a high capability of tracking individuals in real time. According to the evaluation results, the number of false alarms generated by the system is minimal and the maximum alarm delay reported by the system is 2.6 sec which can relatively be reliable compared to the acceptable time for rescue and resuscitation.

