SMART SYSTEM FOR MONITORING AND CONTROL OF SWIMMING POOL

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Abstract

The novel plan put forward in this paper can lessen the need for human intervention in swimming pool maintenance by using a low-cost system based on wireless sensor networks to monitor and control the quality of the pool. This system's primary goal is to offer financial and natural resource savings to the end user, helping to maintain a sustainable environment. This article also introduces a mobile application for interacting with the system that is suggested, allowing users with administrator access to regulate certain acts in the pool in order to maintain certain standards for its quality.

The most popular kind of exercise that many people have used from ancient times is swimming. Beginners frequently find it challenging to breathe underwater, which leads to choking water and eventually a loss of balance that results in a drowning catastrophe. In particular for youngsters, drowning results in a greater rate of fatality without damage globally. An intelligent system should be incorporated with swimming pools to prevent these types of incidents and save lives. The suggested method stops someone from drowning in a pool by activating the alarm and lifting the individual up using a plate. By setting a threshold value, an ultrasonic sensor may determine whether a person drowns in the water or at a higher, safer level.

PROPOSED METHODOLOGY

In particular, a specific type of neural networks called Convolutional Neural Networks (cnns) is best suited for the task of image recognition. So implementation of Long Term Recurrent Convolution Network (LRCN) approach suitable for Video Classification & Action Recognition. The Long Term Recurrent Convolution Network methodology is a combination of Convolutional Neural Network (CNN) & Recurrent Neural Network (RNN). LRCN is end-to-end trainable and appropriate for vast visual understanding tasks such as video description, activity recognition and image captioning. The main idea is to learn visual features from video frames with the help of CNN & then use LSTM layers to transform a sequence of image embeddings into a class label, sentences, probabilities, etc. In this segment, we empirically propose LRCN approach for the implementation of drowning detection as CNN extracts the features from the input provided to the model and then the LSTM layers predict the action of the human whether one is drowning, swimming or diving.

Due to their technical characteristics, such underwater cameras, and methodological aspects, like the requirement for human engagement in the rescue mission, the present solutions supposed to handle the issue of maintaining safety at swimming pools have serious issues. The effective reduction of drownings and assurance of pool safety can be achieved through the implementation of an automated visual-based monitoring system. This study proposes a ground-breaking device that sends an unmanned drone to help drowning victims after quickly identifying them. It can identify a drowning person in three phases using convolutional neural network (CNN) models. The inflatable tubemounted self-driven drone will launch a rescue operation if a situation like this is detected, blasting an alarm to alert the nearby lifeguards. The system also keeps a watch out for acts that can be harmful and lead to drowning. Performance evaluations of prototype studies have shown that this technology can save a drowning victim in less than a minute.