Literature Survey

VirtualEye - Life Guard for Swimming Pools to Detect Active Drowning

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Introduction

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 hotels, and weekend tourist spots and barely people have them in their house backyard. 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. 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. To overcome this conflict, a meticulous system is to be implemented along the swimming pools to save human life.

By studying body movement patterns and connecting cameras to artificial intelligence (AI) systems we can devise an underwater pool safety system that reduces the risk of drowning.

Usually, such systems can be developed by installing more than 16 cameras underwater and ceiling and analyzing the video feeds to detect any anomalies. but AS a POC we make use of one camera that streams the video underwater and analyses the position of swimmers to assess the probability of drowning, if it is higher then an alert will be generated to attract lifeguards' attention.

In this article we are going to analyse the various papers, journals and articles that have been published earlier and provide an idea about the various papers. The various papers related to our problem statement are listed below

1. A Video-Based Drowning Detection System | Alvin H. Kam, Wenmiao Lu & Wei-Yun Yau | Springer | 2002
2. An Automatic Video-Based Drowning Detection System for Swimming Pools using Active Contours | Nasrin Salehi and Maryam Keyvanara | Modern Education and Computer Science Press | 2014
3. A novel drowning detection method for safety of Swimmers | Ajil Roy & K. Srinivasan | National Power Systems Conference (NPSC) | 2018

4. A vision-based approach to early detection of drowning incidents in swimming pools | Wenmiao Lu & Yap-Peng Tan | IEEE Transactions on Circuits and Systems for Video Technology | 2004