LITREATURE SURVEY ON LIFE GUARD FOR SWIMMING POOLS TO DETECT ACTIVE DROWNING THROUGH ARTIFICAL INTELLIGENCE

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SURVEY ON PAPERS RELATED TO SWIMMING POOLS TO DETECT ACTIVE DROWNING

NAME:

Automated and Intelligent System for Monitoring Swimming Pool Safety

AUTHOR:

Aziz Alotaibi

PUBLISHED YEAR:

6 December 2020

BASIC DESCRIPTION:

Recently, integrating the Artificial Intelligence and computer vision has been utilized in swimming pool automated surveillance systems. Several studies have been proposed to overcome off-time surveillance drowning incidents based on using a sequence of videos to track human motion and position. This paper proposes an efficient and reliable detection system that utilizes a single image to detect and classify drowning objects, to prevent drowning incidents. The proposed system utilizes the artificial and transfer learning to provide an intelligent and automated solution for off-time monitoring swimming pool safety. In addition, a specialized transfer-learning-based model utilizing a model pertained on “Image Net”, which can extract the most useful and complex features of the captured image to differentiate between humans, animals, and other objects, has been proposed.

The proposed system aims to reduce human intervention by processing and sending the classification results to the owner's mobile device. The performance of the specialized model is evaluated by using a prototype experiment that achieves higher accuracy, sensitivity, and precision, as compared to other deep learning algorithms.

HIGHLIGHTS OF THE PROJECT:

- The efficiency and robustness of the proposed system are evaluated through several experimental analyses.
- The method achieves an accuracy of 99% on a collected dataset and outperforms existing transfer learning algorithms.
- Project introduces a novel intelligent system for off-time monitoring swimming pools based on Artificial Intelligence.

LIMITATIONS OF THE PROJECT:

The training dataset cannot provide hundred percent accuracy at times. This can be the only biggest disadvantage of this project

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- Cisko. Cisco Annual Internet Report (2018–2023) White Paper. 2020

Name:

AUTOMATED DROWNING DETECTION AND SECURITY IN SWIMMING POOL

Author:

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Published Year:

June -2017

Basic Description:

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.

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

Highlights of this project:

- Video based drowning detection system in the swimming pool
- Drowning accidents is avoided automatically by using the acrylic plate.

Disadvantage:

- This system needs constant observation which is the main disadvantage.

Limitations of the project:

- The occlusion problem arises if there are too many swimmers.
- 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.

References of this paper:

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- Journal of Computational Information Systems 9: 21 (2013) 8619{8627 Available at http://www.Jofcis.com
- International Journal of Innovative Research in Computer and Communication Engineering (An ISO 3297: 2007 Certified Organization) Vol. 3, Special Issue 2, March 2015.

Name:

Name:

The effect of Lifeguard upon the detection of drowning victims in a realistic dynamic visual search task

***Author**:*

Victoria Laxton and David Crundall

Published Year:

2017

Basic Description:

Drowning incidents are potentially severe but thankfully rare for most lifeguards. In regards to lifeguarding, visual search has been defined as observing part of an aquatic environment (beaches, pools, open water), and processing and assessing the events happening within that location. Lifeguards were more accurate and responded faster to drowning targets. Differences between drowning targets were also found: passive drownings were responded to less often, but more quickly than active drownings, highlighting that passive drownings may be less salient but are highly informative once detected.

Highlights of this project:

- The efficiency of Lifeguard are evaluated by arranging experimenter testing sessions.
- Lifeguard identifies both active and passive drowning targets more frequently and more quickly than control participants.

Disadvantage:

- Crowding ,Target-distractor similarity and Attentional set. These factors are the disadvantages of lifeguards.

References of this paper:

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- Berbaum, K. S., Franken, E. A., Jr., Caldwell, R. T., & Schartz, K. M. (2010). Satisfaction of search in traditional radiographic imaging. In E. Samei, & E. Krupinski.
- Biggs, A. T., Cain, M. S., Clark, K., Darling, E. F., & Mitroff, S. R. (2013). Assessing visual search performance differences between Transportation Security Administration Officers and nonprofessional visual searchers.

NAME:

Lifeguards: A Forgotten Aspect of Drowning Prevention

Author:

- David C Schwebel
- Heather N Jones
- Erika Holder
- Francesca Marciani

Published Year:

July 13,2010

Basic Description:

An alarming number of drownings occur in lifeguarded swimming areas, where one might presume swimmers are protected from injury. One reason drownings occur in lifeguarded swimming areas is because lifeguard surveillance is a highly difficult task. Observational research suggests lifeguards are usually alert, but researchers also report egregious examples of inattention. We offer three strategies that have initial empirical support to reduce risk of drowning at lifeguarded swimming areas: (a) regular training to help lifeguards recognize they are vulnerable to drowning events and to raise their confidence; (b) regular practice via simulated emergency responses, and (c) addressing staff schedules so lifeguards can devote full attention to protecting swimmer safety while on duty

Highlights of this project:

- lifeguards attend regular meeting and training sessions

- practice for emergency responses
- pragmatic organizational issues must be addressed

Limitations of this project:

- As adolescents and young adults, many lifeguards are developmentally unprepared to handle the responsibility of their positions lifeguards were attending to their assigned area 91% of the time.8 This is encouraging. However, one should not overlook the corollary to the finding: It also suggests that lifeguards were not attending to potential dangers 9% of the time.

References of this paper:

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