**LITERATURE SURVEY**

In this section, there is a description involving various approaches for detecting drowning.

**Pillalamarri. Laxman 1,a , Dr. Anuj Jain2,b,\* “** *Automation Of Swimming Pools To Prevent Drowning Deaths Using Iot , Sensors And Unique Algorithm* **“ ,** Webology (ISSN: 1735-188X) Volume 18, Number 5, 2021  **[1]** This paper discussed the method used for the drowning detection as a system based on the start of the system, which will begin the Power-On-Self-Test process where all the sensors, the location of the devices, and the alerting of the user by glowing RED lights around the swimming pool so that the user understands the level and status of the security system and chooses whether to use or avoid the swimming pool. In the event of a false alert, a manual reset will immediately stop all running processes and start a power-on self test routine. Because the device has an autonomous rescue element, swimmers do not need to be watched over. The current method is entirely independent of wearable safety devices and does not require any wearable technology. Swimmers have higher confidence in the proposed system because of the robust sensors used. In the case of an unsupervised pool, the mentioned idle condition prevents inadvertent harm to kids, pets, and even the ground. An empty swimming pool can serve as a regular floor for a house or office when placed within a building, saving on the cost of vacant space. The proposed technology offers a way for swimmers to overcome their common fear of drowning and suffocation, which will hasten the depletion of oxygen in their bodies.

**Mr. Pillalamarri.Laxman, Prof. Anuj Jain, “***A review paper on Design And Performance Evaluation Of Drowning Death Prevention System With various technologies.”,* 2019 JETIR January 2019, Volume 6, Issue 1 **[2]** Accuracy, dependability, and comfort in use are the key qualities that differ between methods and equipment. The current study is focused on observing/verifying accuracy, reliability, and comfort in use and making suggestions for improvements. Most crucially, IoT-based pool safety equipment is more susceptible to signal jammers and may not function as a result, opening the door to criminal actions like premeditated killings or being unresponsive in the event of an internet network outage. Nearly all of the sensors employed in the prior art were only suitable for particular settings like hospitals, intensive care units, and nursing homes where elderly patients were under the supervision of trained medical staff.

**Aziz Alotaibi, “***Automated and Intelligent System for Monitoring Swimming Pool Safety Based on the IoT and Transfer Learning*”, Electronics 2020, 9, 2082; doi:10.3390/electronics9122082 **[3]** The suggested system consists of hardware nodes, software tools, and algorithms, and it uses both machine learning and IoT layer architectures to monitor the swimming pool. The hardware elements made up of sensors are capable of both detecting and catching objects that fall into a pool. The captured objects are detected and classified using software algorithms. Comparing the suggested system to the current deep learning algorithm consistently produces better results. The suggested approach reliably achieves a 99% accuracy on three classes and a 100% accuracy on two classes (the human class and the animal and object class). Our suggested layers help our specialised model avoid the overfitting and vanishing gradient issues by taking the place of ResNet50's last layer. In addition, compared to CNN without the pretrained model, the model is used to initialise the weights on ImageNet to speed up convergence and improve performance during training. Second, compared to other systems that require video cameras and other computer resources to process image frames in order to detect drowning objects in a manageable amount of time, the proposed system's design and deployment requirements only include a motion-detection sensor, cameras, a router, and a computer station, making it less expensive. Third, the computing time required to detect a drowning item, which is around 0.56 s/image, is calculated in order to assess and examine the complexity of the suggested system. The system simply utilises a single taken image, which means that it requires less processing time compared to previous systems utilising video sequences.

**Bapardekar Yukta1, Berde Rinku1, Valvi Priyanka1, “***DROWNING DETECTION SYSTEM USING CNN*”, 2022 IJCRT | Volume 10, Issue 4 April 2022 | ISSN: 2320-2882 **[4]** There are two similar systems established on the existing system, and these systems are helpful if a swimmer drowns or sinks to the surface. The current system is more expensive and requires large appliances, whereas our approach uses small equipment and is more environmentally friendly. The system is helpful before a swimmer experiences water trouble. The space allotted for these uses is too tiny, therefore the existing system is primarily utilized in developed nations on swimming pools. In the more recent version, however, we can use any object on an open surface, such as a river or the sea. First, the input is received in the form of images, such as a swimmer swimming in a pool before the camera takes a picture during the video processing process. The image will be captured during the video processing. These images are sent to the Convolution Neural Network (CNN), which checks them to see if any fattling has occurred. If no fattling has occurred, the input process is then continued. Several simulated water circumstances, including water reflection, lightning conditions, and false alarms, have been used to test the system. The system was able to identify every drowning condition as well as the precise location of the drowning individual within the pool. The findings demonstrate that the suggested approach is suitable for usage as a trustworthy multimedia video-based surveillance system.