VirtualEye - Life Guard for Swimming Pools to Detect Active Drowning

Abstract:

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. Swimming pool surveillance systems plays an essential role in safeguarding the premises. 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. The demo system based on pressure sensor has an advantage of convenience, cost saving and simple algorithm.

1.Introduction:

Swimming is a kid's favorite aquatic sport and it's a great stress buster. But in the water, beginners often feel hard to breathe which causes choking actions, loss of balance and results in a drowning accident. Some special circumstances, such as cramps, collide with each other, disease or mental stress and so on may also cause swimmer to drown. Drowning is a leading cause of death and disability for children. Worldwide, drowning produces a higher mortality rate than any other cause of injury in children less than 15 years of age . Younger kids underneath the age of five are at precise threat, suffering the very best drowning mortality rates international. According to the Centers for Disease Control and Prevention, approximately one thousand children die from drowning annually in the world. In thisaccidents is avoided automatically by using the acrylic plate.

2. LITERATURE SURVEY

2.1 Video based drowning detection system in the swimming pool

Swimming pool drowning monitoring system based on video technology is mostly reported in the literature. There are three kinds drowning monitoring system according to the different position of the camera. One is that the camera is mounted on the underwater swimming pool wall, then monitor underwater swimmer status. A limitation of this equipment is that if too many swimmers, the occlusion problem arises. The other is that the camera is mounted upon the water, and monitors the Swimmer posture change

2.2 Wearable devices for early monitoring and alarming for drowning incidents

The wearable drowning monitor device can detect drowning accident and alarm. The device has seven main modules, including microprocessor, power module, SD memory card module, LED warning module, acceleration sensor module, water pressure sensor module, and keys module.When swimming the human arm must constantly waving in the water, if drowning, arm motion of floating is significantly reduced, and if falling into the water, almost motionless. According to the physiological response of human drowning, it can detect drowning accident by recording arm motion real-time through wearable wrist accelerometer device. This accelerometer is packed with embedded functions with edible user programmable options, configurable to two interrupt pins. Then, analog signal obtained from the three axis acceleration sensor is converted to digital signal and three axis acceleration values are gained. Hanning filtering method and the moving average filtering are used to reduce noise error. If the swimmer lost consciousness because of drowning, the device detects the drowning accident and will ON LED light to inform the lifeguard.

2.3 Automated drowning detection system in the swimming pool

In the proposed method the human identification in the swimming pool depends on the laser. First, data from a water pressure sensor is used to judge whether the human body in the water, if the body in the water,then start downloading judgment process.The iron metal plate is placed in the floor of the swimming pool. The laser and the LDR source are placed in the side of the wall. Here we are using an ATmega8l microcontroller to control the whole process. Embedded c language is used for the coding. Initially the laser source which spreads over the swimmingpool and the LDR which sense the laser light and which produces the resistance value.The resistance value will be changed with respect to the human movement. The message will be sent to the administration by using the GSM service. After 30 seconds there is no change which means the plate will lift automatically using the motor and motor driver. The human has safe in this technique.

Ref-Link:

1)https://docs.google.com/document/d/1EdKnH5D-uNuB8YaXcrK-Ckv8BHjFgyV0n7hJoAuIo_Y/edit

2)https://www.linkedin.com/company/aqua-teik

Journal of Computational Information System

3)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