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Research Article

AI Algorithm Based Jacket Ejection For Automatic Security System in Water Bodies

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Abstract: It is tedious process and takes time to detect the person on water by usual ways like with the help of rescue team and divers. To overcome this, we have introduced this work with a life camera and edge detection algorithm for detecting drowning person. When raspberry PI identifies the drowning person, it will initialize the servo motor which will eject the life jacket automatically. The greatest advantage of this proposed work is that this whole system is made into a boat shaped bot and is completely automatic process. Python language is preferred for AI algorithm and to specify edge detection process.

Keywords: Microcontroller, raspberry pi, servo motor drive, l298n drive, prominiand camera.

1. Introduction

Artificial Intelligence is an ability of a computer or any computer based systematic robots to do tasks which are related to intelligent beings. [1] This type of intelligence are used in ability to reason, learning from past experience, discovering something etc., an example is playing chess in computer.AI basically learn things from algorithm which is given to the system. This algorithm is a set of instruction that a computer can execute. Most of the algorithm usedare capable of learning from data. In this proposed work, edge detection algorithm is given as input for the system to proceed with the process.[2] Whenever a person is drowning in water, their hands will rise up to seek help. This hand detection is traced by edge detection algorithm. Once if such a person is found, the bot will reach the person and will eject the life jacket towards them. [3] This is completely automatic and will keep on tracking the water body in order to help the people in water through a camera. Processors will help in movement of the bot, and will be in motion.

2.Review of Related Studies

A computation approach to Edge detection- published by John canny describes the definition of comprehensive set of goals for the computation of edge points. [4] The disadvantage of this work is the NPM which is very low and unable to achieve maximum accuracy. Another comprehensive study of edge detection for image processing applications by P Ganesan demonstrates the various edge detection with the disadvantage of high complexity.[5] Another available system in current world is that if a person is drowning, a camera will continuously survey on the surface of the water and will send alert information to the control room. Then the rescue team will reach the spot and help the drowning person.[6] The drawback of this work is in which it is a delayed process and involves risk for the person who needs help and the person who is going to help. So this proposed workprovides a automatic security system with movable robot.[7]

3.Proposed system

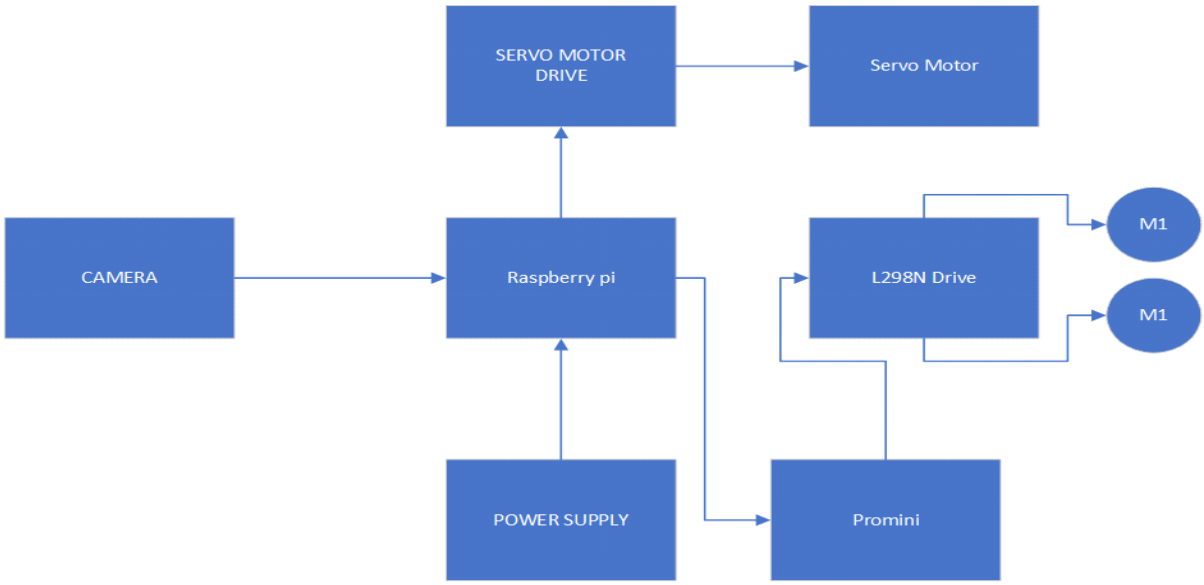
In this proposed work, it has a boat shaped bot with high resolution camera to detect the person drowning in the water and this bot will reach the person and help them by ejecting life jacket towards them. The advantage of

this work is to give the drowning people a rescue measure than giving a warning signal to rescue people.Ithas the greatest advantage to help people with automatic process by reaching the spot and helps them with life jacket.

4.Methodology

In this proposed work, the security system is embedded with Raspberry PI 4 which have the algorithm for edge detection with artificial intelligence technology.[8] The Camera, DC motors, Promini microprocessor, Servo motor are used for life jacket ejection. The camera will check for person drowning in water and once it finds with edge detection algorithm then it will move towards the person and servo motor will eject the life jacket.

5.Block Diagram

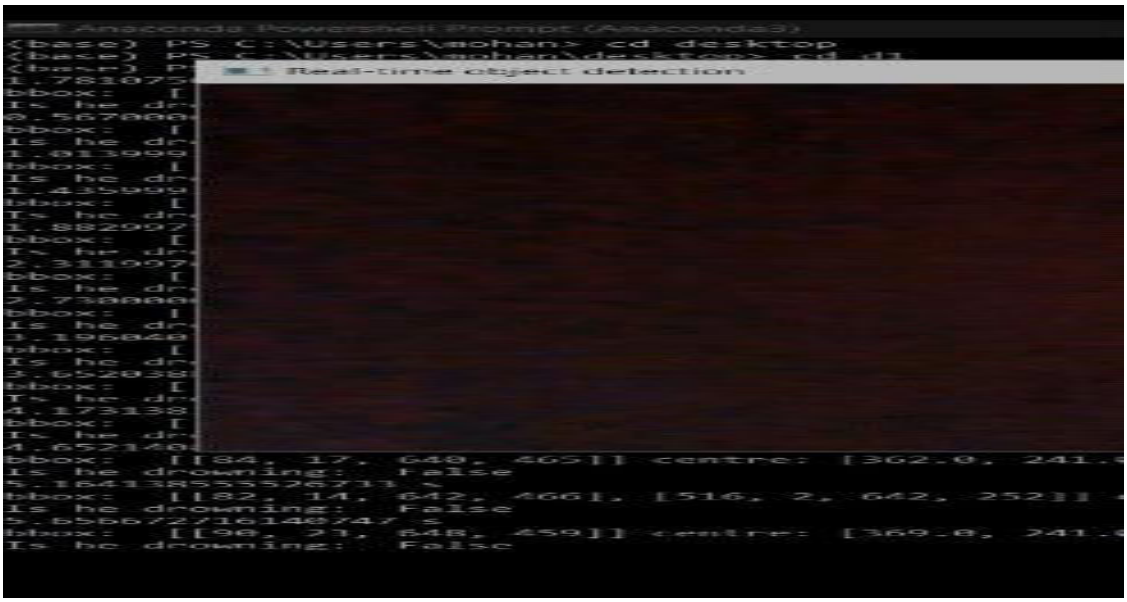


6.Working

The entire system is made into boat shaped bot and is allowed to float in the water body. The camera is of high resolution and will reach up to 20 meters. The raspberry pi is loaded with AI algorithm for edge detection to check for hand rise signal.Once if it is detected, the raspberry pi will send information to Promini which is responsible for the movement of the bot and will reach the person with the help of DC motors. After reaching, the servo motor will rotate in the direction towards the person and will eject the life jacket towards the person who is drowning. This is a complete automatic process.

7. Software

Here Anaconda prompt is used to detect the program status. Once the program is allowed to run, the camera will switch on and if a person is detected the condition changes from false to true.



8.Hardware Prototype

This bot is made of PVC pipes so that they can float in low scale.

9. Conclusion

This prototype is an automatic security system which gives solution for the people who needs help in water body. From this proposed work,everyone gets benefited which is a life saving project. This workprovides solution for unexpected disaster happening because of the lack of swimming experience.

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