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INTELLIGENT SYSTEM FOR MONITORING LINE OF SAFETY IN RAILWAY PLATFORMS BY USING RASPBERRYPI.

L Sindhu PG-Student Department of CSE, Hindusthan College of Engineering and Technology, Coimbatore –32	T.K.P.Rajagopal, Associate Professor, Department of CSE, Hindusthan College of Engineering and Technology, Coimbatore –32	**S.Uma,** Assistant Professor Department of CSE, Hindusthan College of Engineering and Technology, Coimbatore –32

ABSTRACT:

NowadaysPopulationGrowthisincreasingRapidly.Thelineargrowthofpopulationhasresultedinmany PassengersusingRailways.Asaresult,morestrictsafetyrequirementsforrailwaysignaling,control,andinfrast ructureareneeded.Accompanyingthat trend, in recent years, machine learning techniques have also advanced rapidly.People counting systems aim at automatically estimating the number of people indoorandoutdoorplaces.Theyarewidelyusedinretailenvironments,determiningconversionratio,advertisi ng,andpromotionalevaluationsandtheycanbeusedforthetransportationmanagement system and video surveillance. This project presents a model of estimatingthe number of people in railway scenarios based on the deep neural network algorithmYOLO.Wehaveinthisprojectdevelopedasystemcapableofautomatingthelightingonrailway Platf ormsbasedonthePassengerCountinRailwaysandalertingifapersonisinanunsafe zone whenthetrainarrivesatthelocation.

Keywords : Fatigue detection, ultrasonic sensor, EARalgorithm, Arduino UNO, Open CV, DHT11

temperature sensor.

1. INTRODUCTION:

The evolution of technology is multiplied appreciably nowadays. In future maximum of work which is done by human will be taken over by the way of machines. Also most of the people agreedthat machines make peoples as lazy, and it is the plain truth that it is the bettermind of mankind. The elder people have to confront this generation technologies every day, and it affects their daily life style from their previous life style.Home existence is developing with the route of intelligencealong with the acceleration and development of mobile internet among people. In day to day life mouse manipulate, menu operation manipulate, button manipulate and also touch show display manipulate and it is not comfort during people workload also make more complication during work. Especially it is hard for elder peoples. In this paper based on Arduino UNO a smart home controller is designed for elder people by monitoring their facial image statistics and control the residence environment based on the result.

2. LITERATURESURVEY:

Xiangwei Wu1, Man Zhou 2, Li Wag 1, Chong Xu1, Zhiyong Zou1, Ying Wang1 (2020) published the paper “Design of smart home controller based on raspberry PI” from this paper the fatigue state of the human is monitored by using humidity and temperature module, LCD screen and hardware intelligent control also with open cv and raspberry pi. In dim light the peoples are not monitored properly.

Kruti Goyal, Rishi Kumar, Kartikey Agarwal 2017 published “Face Detection and Tracking using open CV”. This paper is designed to deect faces from video cameras. It used the algorithm Haar cascade and Adaboost algorithm. Its is classified based on time and space. And they specified Haar cascade is the best way to detect the face accurately.

The system which is proposed by SereeKhunchai contain temperature sensor, light dependent resistor, PIR sensor, security system, node MCU Arduino a IP camera consist of motion sensor along with lightning system and fan. An application called LINE Notify is used for notification. Manual and automatic system is used for smart home to show the result of the electronic appliances.

3. DEVELOPEDMETHODOLOGY:

This device contain the Arduino UNO along with the humidity detection module, temperature module, and camera module. Here the Arduino UNO is the primary controller, based on that the orientation and location of the digital camera is adjusted and it find the facial image clearly.

The first process is to detect the person face information through the camera module, if the camera can’t able to find the facial image then it turns by 30 degrees by using servo motor. To detect the face of the human the steering module is adjusted to rotate 180 degrees forth and back. Then the

application to detect the fatigue state is checked to conclude whether the person is sleeping or not.

3.1FATIGUESTATEDETECTIONMODULE:

The image of the person is detected through the camera and the face vicinity is extracted from the image, it is the process in fatigue state detection module. There are 68 face characteristics factors in face vicinity. It is marked inside the face.

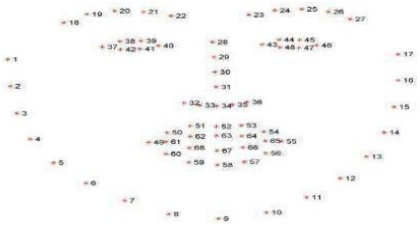

Fig 1The68 - pointmarkermodel

The 68-point marker technique is used for eye characteristics extraction. With the help of EAR parameter the eye closing degree is measured. From calculating the EAR value the eye closing state is identified. The person sleep is calculated based on the eye blink rate. The EAR algorithm calculate the person sleep from landmarks which is detected from the face.

3.1.1 EARALGORITHM:

In 68-point marker of Dlib based on width and height of eye co-ordinates the EAR algorithm is calculated. From Eye aspect ratio equation p1 and p4 is used to measure the width of the eyes in m (meter), p2, p3, p5 ,p6 is used to measure the height of the eyes in m (meter).

The Ear value reach to 0 when the eyes are closed and if it is constant then the eyes are opened.

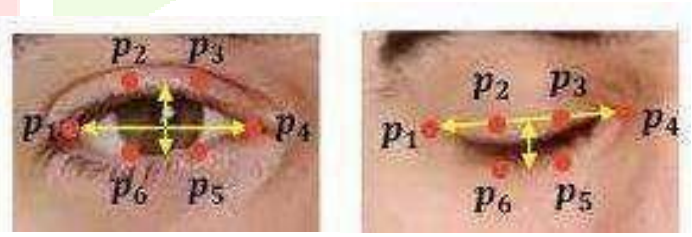

Fig. 2 Eyes Opened and Closed

The image which are collected are processed then the python programming is used to find whether the person is sleeping or not. If the person is detected as sleep then the information is transferred to Arduino UNO with the help of ubidots server. Now the Arduino module will control the lamp brightness and fan based on the information which is received from the ubidots server. While in case of dim light the motion of the human is monitored by the help the ultrasonic sensor.

3.2 ResearchMethodology

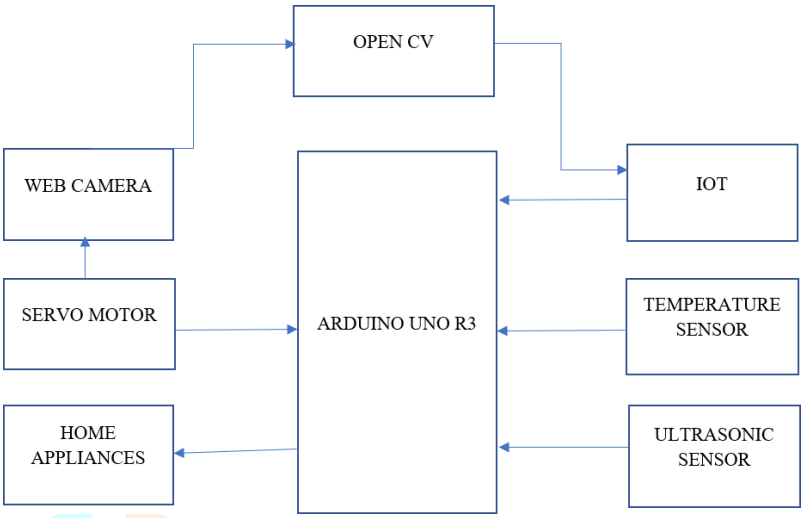

Fig.3 Blockdiagram

The web camera rotate 180 degree front and back with the help of servo motor until it detects the face. Through web camera the person image is captured by the fatigue detection and EAR algorithm in open CV. After the process we can able to get a value based on that value we can able toknow the person fatigue state. By continuous detection of 25 frames we can conclude the person fatigue state. The persons fatigue state is sent to the ubidots. Here ubidots is a IOT platform. Then the received data is transferred to Arduino UNO through the IOT platform and based on this data the home appliances act accordingly at the given condition. Temperature sensor detects the temperature of the room and the ultrasonic sensor find the motion of the person in dim light.

4.RESULTSANDDISCUSSIONS

4.1 OVERALLSETUP:

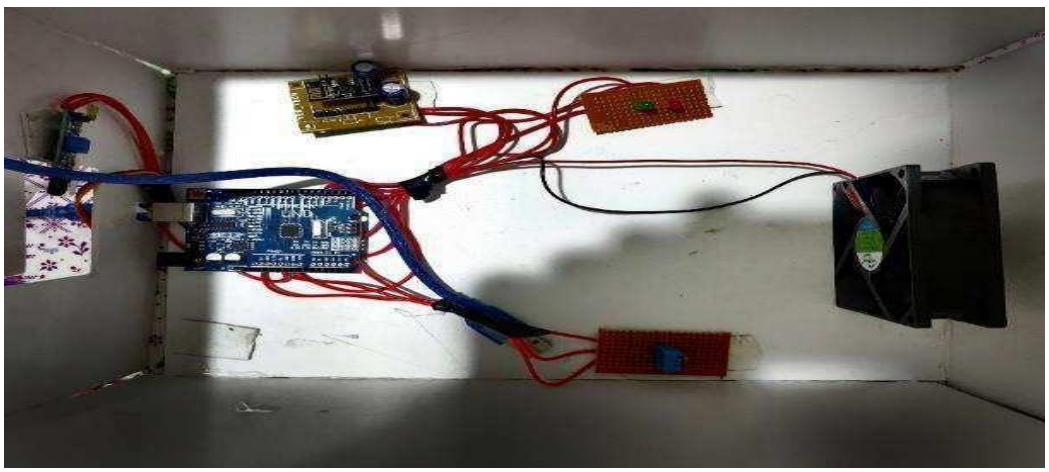

Fig4 PrototypeofSmartHomeControllerUsingOpen CVdesignedusingArduinoUNO.

4.2 CAMERAMODULE:

Fig5PrototypeofSmartHomeControllerUsingOpen CV

The web camera is fixed along with the servo motor. By help of servo motor the web camera can rotate 180 degree front and back with the delay of 20 seconds for accurately detect the image.

4.3 SLEEPDETECTIONMODULE:

Fig.6 Sleepdetectingmodule

Fig.7 Sleepdetectingmoduleidentification

To find the region of eye from face the EAR six co-ordinates are used. Each eye contain 6(x,y) co-ordinates, and it starts from left corner of the eye. The six facial landmarks are used to detect the eye accurately even in case of spectacles.

Fig8Sleepdetectingcomparison

By varies titling angles the sleep activities are compared the values varies from 0 to 1 with x and y direction. The movement of eye position is compared with variable positions.

4.4 HOMECONTROLMODULE:

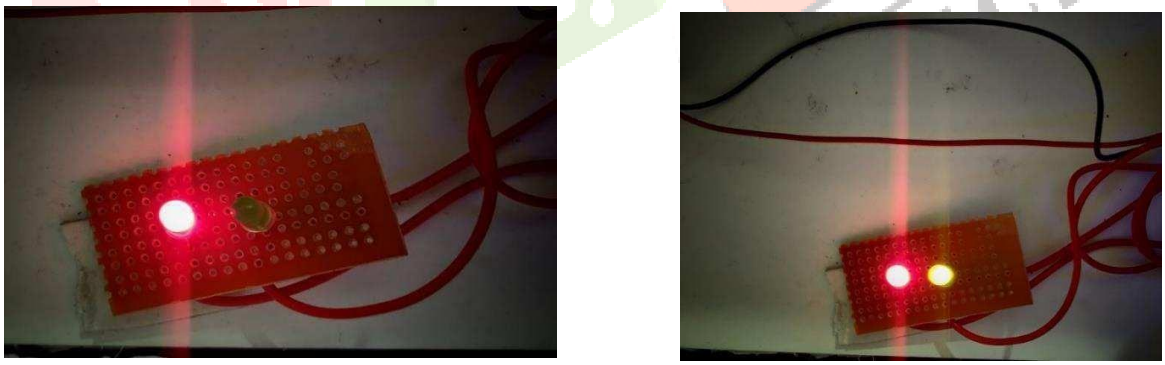

Fig. 9Lightturnson

In above picture the red light indicates room of the lights are turned off when the person is detected as sleeping and the fan is turned on when the temperature of the room reached to 28°C. Then the green light shows the motion of the person after sleep. The lights are turned ON after finding the motion of the person.

5. CONCLUSION:

The system which we implement here has easy structure, easy to operate, with improved detection speed. the fatigue state of the person is accurately detected and monitored in this experiment. This system uses the Arduino UNO board to utilize the open CV and Dlib as with the face detection deone with various key points indication of EAR algorithm. The EAR characteristics parameter is calculated to find the fatigue state of the eye, with real time indication the accuracy of the system is improved along with various parameters. With the help of Open CV and EAR algorithm the eyes are detected easily even when the person wearing spectacles. The problems which are faced during bad light conditions are cut off in further extends.

1. REFERENCES:

[1] Zhiyong Zou1 ,Ying Wang1 ,Li Wang1 ,Xiangwei Wu1 ,Chong Xu1 ,Man Zhou2, , "Design of smart homecontroller based on raspberry PI," in IEEE International Symposium on Consumer Electronics, Singapore, 2020,pp.192 – 195.

[2] SereeKhunchai , ChaiyaponThongchaisuratkrul , "Development of Smart Home System Controlled byAndroid Application,"IEEE,vol. 6,pp.33-43,2019.

[3] Kruti Goyal , Kartikey Agarwal , Rishi Kumar , "Face Detection and Tracking Using OpenCV ," IEEE , vol.8, pp.5-11,2017.

[4] M. S. H. Khiyal, A. Khan, and E. Shehzadi, "SMS Based Wireless Home Appliance Control System (HACS)for Automating Appliances and Security," Issues in Informing Science and Information Technology, vol. 6, pp.887-894,2017.

[5] M. R. Kamarudin, M. A. F., and M. Yusof, "Low Cost Smart Home Automation via Microsoft SpeechRecognition,"InternationalJournalofEngineering&ComputerScience, vol.13,pp.6-11,June2013.

[6] B.Kaur,P.K.Pateriya,andM.K.Rai,"Anillustrationofmaking ahomeautomationsystem usingraspberryPiandPIRsensor,"in2018International ConferenceonIntelligentCircuitsandSystems(ICICS), 2018,pp.439-444.

[7] S.Suresh,J.Bhavya,S.Sakshi,K.Varun,andG.Debarshi,"Homemonitoringandsecuritysystem,"in2016 InternationalConferenceonICT in Business Industry&Government(ICTBIG,2016), 1-5.

[8] P. Viola and M. J. Jones, "Robust real time face detection," International Journal Of Computer Visionvol.57,no.2,pp.137-154,2004.

[9] K. Shrivastava, A. Verma, and S. P. Singh," Distance Measurement of an Object or Obstacle by

UltrasoundSensors using P89C51RD2," International Journal of Computer Theory and Engineering, vol. 2, No.1 February,2010,1793-8201.

[10] GV Balakrishna , B. Santhosh Kumar, "Smart intruder detection using video surveillance," InternationalJournal Of ScienceTechnologyandManagement,volno.5,Issueno.2,February2015