SmartTrafficMonitoringSystembasedonvehiclecounts.

group04

- **au820421106012|** Durgesh **| Phase01**

ThetrafficManagementsystemisthekeystoneofasmartcity. Ifthenumberofvehiclesthataretobepassedthroughacrowdedjunctioncanbepre-estimatedintime,traffic blockagecanbemanagedeffectively.Inthispaper,amethodisdemonstratedtocontrolthetrafficsignalsbasedonthecount ofautomobilesandpedestrians.Thedatafrombothesesystems are given to the Node MCU board. The proposedmethod presents a framework, which will optimize the timingintervalofthetrafficsignalpurelydependingonthenumberof vehiclesonthatparticularroadside.Thenumberofvehiclespassin g through an area well before the preferred trafficjunction can be estimated using the help of image processingtechniques. Further, the monitoring information can be sharedtoadistantcontrollingcentersituatedanywhereinthecityvi a internet usage. The decrease in waiting time for drivers tocrosssignalwillbethemajoradvantageofthisproposedsystem.I nthismodel,weareusingOpenCVforimage processingandvehicledetection.Theinputofthesesystemsisvehicl escountsoneachsideoftheroadfromthecrossingsignalandthisinp utwillbedeterminedbyhowmuchtimeis tobeprovided.

:Traffic ManagementSystem(TMS),OpenCV,NodeMCU,ImageProcessing,VehicleDetection.

KeyWords

1. INTRODUCTION

TrafficCongestionisanexcessiveandconspicuoushassle, properly controlled via the use of website onlinetrafficalerts,andadependablewaytoperformintersections inside the everyday website visitors worldwide. numerous breathing troubles such as bronchial asthma and bronchitis due to exposure to avenue dust and automobile emissions. in addition, traffic police and pedestrians are at multiplied risk of lung maximum cancers because of publicity to air pollutants that WHO has classified as carcinogenic.

Many troubles arise due to the normal individual timer. They repeat the identical segment series and no longer use the shopping for and promoting duration. similarly, the long-prepared time of the car in the usage of mode ends in inefficient gas consumption and multiplied environmental pollution.

India is many of the 10 countries with the maximum web page traffic congestion. Mumbai, Bangalore, New Delhi. human beings are under pressure to spend hours with site visitors and waste valuable time commuting. cutting-edge web page traffic mild controllers use tough, speedy timers and do not adapt to real-time site visitors on the road. to alleviate traffic congestion, we have advanced an advanced traveler management tool that could autonomously adapt to the vacationer's scenario on Traffic symptoms within the shape of a computer imaginative and prescient-primarily based traffic mild controller.

1.1 ExistingSystem:

In India the existing traffic system is for each red signal 60 seconds will be given, whether the traffic on that particular road is heavy or light, with this the wastage of time will be high and traffic in other lanes will be increasing.

1.2 ProposedSystem:

The main objective of the project is to design a traffic light system based on the vehicle counts in that current situation. Here the proposed system takes the live streaming from public surveillance cameras at traffic junctions and detecting the vehicles at the signal sets the green signal time.

Here vehicles will be classified such as cars, bikes, buses/trucks, and rickshaws to obtain a more accurate estimate of the green signal time.

Our proposed system will pass the live streaming from public surveillance cameras from the traffic junctions. In the cloud, the algorithm will process the live cam feed and every frame from the live is processed and will go through the OpenCV filters and detects the contours and movements of objects on the lane (road) in the feed and considers and distinguishes it as vehicles, animals and human beings which are taken into account and density of the traffic is defined and the magnitude of the instantaneous density and increment in density is sent to the on-board vehicle manager and vehicles traffic management algorithm will decide which lan traffic light will glow first and for how much of the time will be needed to that particular lane and update the red signal times of the other signals.

dTe2.IMPLEMENTATION Example:

1st lane = 30 Vehicle

Counts2ndlane=40VehicleCo

unts3rdlane=60VehicleCount

s

so,thetimedividedistothelanesislike

Green light time for 1st lane = [30/ (30+40+60)] *120

secGreenlighttimefor2ndlane=[40/(30+40+60)]*120secGr

eenlighttimefor3rdlane=[60/(30+40+60)]*120sec

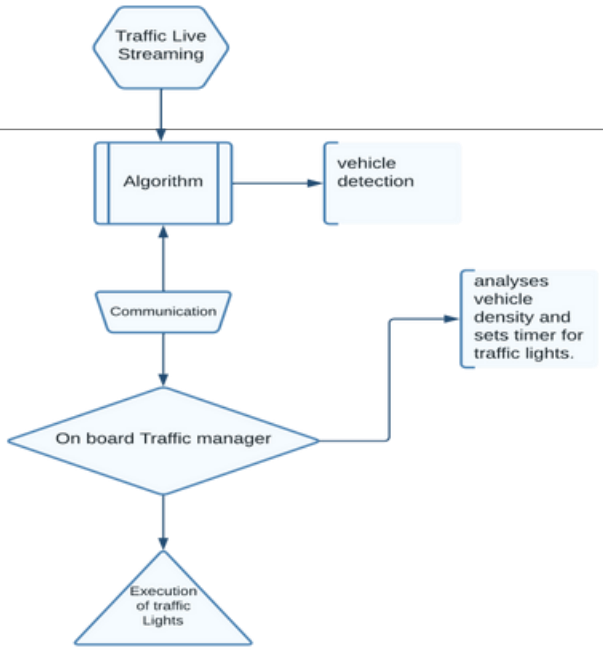

Fig.1.ProposedTrafficmodelsystem

Traffic Management System is to get the vehicle counts inreal-timebyusingOpenCValgorithmsinthecloudherewearedetecting themovingobjectsinthelivecamusing backgroundsubtractionalgorithmslikeMOG,MOG2,GMG

InourcriteriaweusedMOGtoeasilydetectthemovements andtogetridofshadowandnoiseweusedgaussianblurandalsoconvertedthevideoframesonebyonetogreyscaleand then passed through the Image subtraction MOGalgorithmsotheupperlayeroftheframeshasbeendetected and then the algorithm will mark it with rectangle frame forevery moving objects so an if loop will count the number ofrectanglesbyaddingadotintherectangleandthenwehavecreatedavirtuallineintheframesothenumberofdotswhichwillcross theline isthecount ofvehicles.

Fornow,thecloudimageprocessingisdone.Fromherewe havetotransferthenumberofvehiclesineverylanesdatatotheon-boardtrafficmanagingunitwhichisanIoT-basedmicrocontrollerNodeMCUthetransferofdataisdonebyTCP/IpusingpythonURLandHTTPSlibrariesheretheIPaddressoftheNodeMCUofeverylaneisprovidedtothecloud in a table or a datagram so that the data is sent to therespectiveon-boardtraffic managementunits.

Theon-boardunitwhichisNodeMCUwillcalculatethetime tobeallocatedtoeverylanetrafficsignalaccordingtothedensityby dividingthe2-minutetimeframetoeverylaneaccordingtothepercentageofdensityontherespectivelanes.

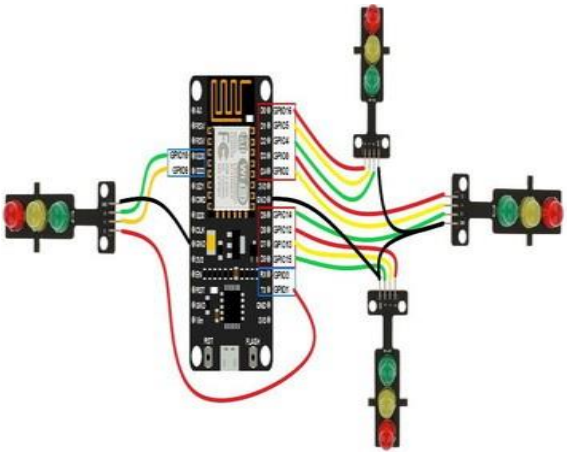

Fig.2.NodeMCUInterfacing

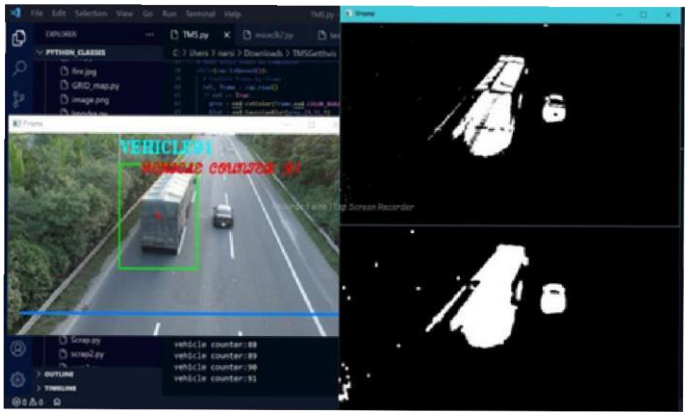

Fig.2.Real-timeoperation.

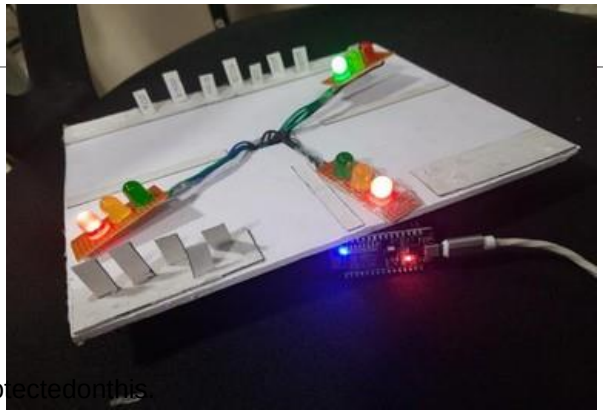

Fig.2.Trafficlightsignalinaworkingprocess.Synchronizationofsitetrafficsignalsthroughoutmorethan oneintersection.Synchronizingindicatorsalongastreetcan

3. CONCLUSIONS

gainthecommutersassoonas avehicleenterstheroad,it cancontinuewithminimalprevention.

Wearesuccessfulinclassifyinghumans,vehicles,and animalsaspreciselyaspossible.Detectionofthese at objects willvaryaccordingtotheweatherconditionsas wellasdayandnightduration,wearetryingtoimprove oursystemforeveryweatherandlightingconditionasthewhol esystemdependsuponthequalityofvideocaptured by the cameras like exposure, saturation, hueand color temperature. Our algorithm divides the trafficlighttimingefficientlysentaspossible.So,ourwhole trafficmanagementsystemworksnearly96%efficientlywhen comparedtopresentworkingtrafficmanagement systems.

4. FUTURESCOPE:

Becauseofthenon-stopincreaseofthepopulationinside the global, it is an extraordinary challenge for theimminent generation to manipulate the Traffic system. agood deal of improvement will come in the future. Tomanipulate the conventional transport device, we mustconsideranintelligentandautomatedmannerofcontroll ing the machine. as the population increases, itwill increase the range of motors also. to manipulate thehuge wide variety of vehicles intelligent methods ought tobe followed. For future purposes, we can use the picturesensororimager.Itdoesitsworkbygeneratingphotos oftheroads.Itcreatestheimagewiththeaidofchangingthe variable attenuation of mild into a sign that conveysthephotograph.

The venture can be further increased to consist of thefollowingfunctionalitiestoenhancetrafficmanagement and conveydown congestion:

Identityofautomobilesviolatingtrafficregulations:The motorsgoingforwalkspurplelightingfixturescanbediagnose dinaphotographoravideomoveusing

definingaviolationlineandtakingpicturesthewidevarietyplate ofthephoto ifthat line iscrossed whenthe sign ispink.

Lane changingcanalsoberecognizedinaddition.thesemay be accidentorbreakdowndetection:Intersectionsalsotendto revelinintensecrashesbecausenumeroussortsofinjuriouscras hes, consisting of attitude and left-flip collisions,commonlyoccurthere.consequently,accurateandac tivateddetection of injuries at intersections gives remarkableblessings of saving houses and lives and minimizingcongestionanddelay.thiswillbeachievedwiththeaid offiguring out the vehicles that remain desk-bound for a longterm in an inappropriate function together with within themiddleofthestreet,sothatparkedautomobilesarenot protectedonthis.

Adaptingtoemergencymotors:Emergencycarssuchasan ambulancewanttoacceptfasterpassagethroughthetrafficindic ators.Themodelcanbeeducatedtohituponnolongerjustcarsbu tadditionallybeabletorecognizethatitisan emergencyvehicleandhenceadaptthetimerssuchthatthe mergency vehicle is given priority and may cross the sign the earliest.

REFERENCES

[1]A.Kanungo,andA.Sharmaintheyear2014, proposed a solution using video processing. The videofrom the live feed is processed before being sent to theserverswhereaC++-basedalgorithmisusedtogeneratetheresults.Hardcodeand Dynamiccodedmethodologiesarecompared,inwhichthedy namicalgorithmshowedanimprovementof35%.

[2] SakunaProntri,andPongpisitWuttidittachotti,inthe yearof 2015,proposedafuzzylogic-controlledtrafficlight canbeadaptedtothecurrenttrafficsituations.This system makesuseoftwofuzzycontrollerswith3inputsand one outputforprimaryandsecondarydriveways.A simulation was donеusingVISSIMandMATLABandforlow traffic density,itimproved trafficconditions.

[3] SiddharthSrivastava,andRajKamalintheyear 2016, proposedtheuseofadaptivelighttimercontrolusing image processing techniques and traffic density. This systemconsistsofamicrocontroller-controlledtrafficlighttimer,high image sensing devices, MATLAB, and transmissionusing UART principles. However, this system fails toprioritizetheauthorizedemergencyvehiclesnorto detect accidentsattheintersection.