Journal of Cardiovascular Disease Research

ISSN: 0975-3583, 0976-2833 VOL 06, ISSUE 01, 2015

IDENTIFYING WOMEN HARASSMENT IN PUBLIC CCTV CAMERASUSINGARTIFICIALINTELLIGENCE TECHNIQUES

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Abstract - The society probably living in the worst time. Our current society has ever seen in terms ofwomen security. The projects aim is to make women experience as strong as ever and sufficiently ableto fight the parasites of our general public. Our project is an idea that makes every place safer forwomen.Nowadaysthenewsaboutwomenharassmentismorethantheiraccomplishments.Thepurposeof the proposed system is to decrease the incidence of sexual harassment faced by women in their lifeexperiencesandtoincreasewomen'sself-confidencetostepoutintotheirofficeduringnightsanddesiretouse publicspacesinthecity especially duringnighttime. Womenfeelunsafe at bizarretimes to be moving alone. There are many applications built for the safety of women.Even there aremany uneducated women those who do not have android phones or do not know how to handle it. Theproposed system aims to provide safety for women who are in trouble. Surely there will be CCTVcameras in every public place. This model does not require any special hardware and it uses algorithmfor the precaution of women. The algorithm is then applied on the CCTV cameras and then the genderof the person will be predicted. The alert message will be sent to the nearby police station. This projectis designedfor the conveniences of allwomen.

Index Terms *---MIL – Multiple Instance Learning, SVM – Support Vector Machine, C3D – Cafe to support3-DimensionalConvolutionNetworks,HOG–HistogramofOrientedGradient,AI – ArtificialIntelligence.*

1. INTRODUCTION

Among all other countries in earth, India consumes a loathsome roadway record in all types of sexualexploitation in homes, on streets, in public transports and even workplace. Indian women are in a continuousstate of diligence, like a country on terrorist alert. A lot of NGOs and helpline numbers have been organizedin previous years, but they are all cures for the harassment that has already occurred and not the 'preventions'that we need. There are certain pre-existing CCTV cameras that don't ship a message to the saved contacts;however, none of them is short enough. According to a survey, the present-day generation doesn't makewomen safe. The project is to make an effective, rapid and reliant mechanism to make women to feel secureand empowered. Our concept will act 24/7 make women never feel alone. This device will help the police tostopcrimeagainstwomen.Thisdevicehasbeendesignedinawaythatitcoversthediverseconditionafemalemaybecaughtinlike whileshe is aloneor when sheisin a crowded area,etc.

The proposed system is a fully integrated advanced AI based system which can clearly identify thesituationofthe victimbyusingpublicCCTVcamerasandisprocessed usingjetson nanoandprovidesanon-timeprotectionsystemlikealertmessageimmediatelytothenearbycontrolroomora policestationtorescuetheconcernedauthoritiesaccordingtotheseverityofthethreat.Thisautomaticsystemisbestsuitedforeverysituation rather than the conventional manually triggered system. This system offers a great reliability andsecurity and can be further used to provide a safe navigation path for women to travel when alone and alsoworkas a personalsecurityassistantlike Googleassistantinthe forthcomingyear.

2. LITERATURESURVEY

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MirjamJutila, et al (2014) proposed the spic and span thought of appropriate sensor watch.Assuranceforwatchformat,doorwayaccomplishment,andSensornetworkfactorshasbeenactualizedon thiswork.Theboundariesofthisartworksarethegadgetutilizedmightbeextremelymonstrousinsize,itcan't be conveyed to areas allwe walkoff[1].

Samuel Tanga (2016) states the possibility of sensors in his work" improvement of Prototypeclever home ability lights control engineering utilizing Sensors On a board phone Computing device"."LuminairecontrolledthroughtheArduinomicrocontroller"hasbeenused.Thelimitationsofthisideaar eWIFIor web is expected toworkthe product[2].

John Ayoade (2007) used the idea of RFID in his work "Guide to comprehending security andunadulteratedworriesinRFIDframework".Flexiblychainadequacy,squanderremovalhasbeenactualized[3].

LuigiAtzorietal(2012)madethenearinvestigationofsocialnetofthingsinhiswork.Heassertshow cloud and web of things are fused together. The constraints of this work are the way the machineworks,it's notjuststated.[4].

Carolyn Whitzman et al (2009) have come up with another idea of women's insurance thatguaranteesthattheremustbeafewestimatesofwell-beingthatshouldbemadeavailabletowomeninthegeneral public. The limitations of these compositions are the least difficult to examine the safety of theladies,butthe gadgethas notbeen executed[5].

Life360: it is far from a circle of relative locator cellular software that enables a person to share aplacewitha relative'scircleofindividuals. Theuser cansetupagroupwith his orherfriends and familymembers;alertstheuserwhilethegroupcontributorsareclosetothem;thisappalsohelpswomeninemerge ncysituationswhiletheyareinahazardscenario,andsendsaplacetothegroupofindividuals[6].Parthsethi et al (2018) exemplifies the hypothesis of the use of alert machine in his artistic workspublishedin"SafeSolePainAlarmGadgetforWomenAssuranceoftheUseofIOT.""Essentialcontroller, GSMmodule,GPSmodulecontraptionformotioncontrol,smartcellphoneinterface".The limitsof thisworkaretheneedfor asnapina cellthatmaynothave mechanized recognition[7].

Zhen Yan et al (2014) created a web of variables in his works of art. In his canvases, the devicemodeloftheweboftthingshasbeenupdated.Theissueofthisworkisterribleatwork,andthearrangementtak es alongtime[8].

Phooshkarrajivetal(2016) the utilization of "electronic mail in email based distant admission toand observation framework for astute home foundation". "the email from installed machine to individualand react handling has been actualized on this work". The limitations of this work are that the product isexceptionallyrich andGPSand GMS arenotused[9].

3. METHODOLOGY

Although there are usually specialized apps and many IOT-based ideas for women's safety, thisproposedsystemdoesnotrequireanyspecialcomputerhardwaretobeprocessed.Since,itisuserfriendlyandwillb esupportivefortheuneducatedandpoorpeople.Thefeaturesarepreprocessed,selectedandareappliedto Convolution Neural Network (CNN) and tensor flow for classification. The project is classified into threemodules.

a) HumanDetection

b) GenderPrediction

c) AnomalousActivityDetection

Step1: Startthe process

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Step2: AccessthelivestreamoftheCCTVcamera..RealTimeStreamingProtocol(RTSP)isusedtoaccesslive streaming and take control between the end points. Most commonly used protocol for accessing a livestreamingcameraisthe RealTime StreamingProtocoland the RealTime ControlProtocol.

Step 3: Detects the Presence of humans. There are many object detection algorithms available to identify anddetect the presence of an object. R-CNN, Single Shot Detector (SSD) and YOLO (You Only Look Once) arethemostcommonlyusedreal-timeobjectdetectionalgorithms.InordertoimprovetheefficiencyoftheYOLOalgorithm, a single phase object detection methodology is implemented. The YOLO algorithm converts videoinput to frames and applies bounding box coordinates for efficient object detection. Bounding box detects thepresence of an object in a video by forming an imaginary box in a 2Dimensional frame. One detection ofbounding boxes in the presence of humans was evaluated on the basis of a pre-trained YOLO object detectoralgorithm.

Step4: Ifanyhumanactivityisdetecteditwillenterthenextmodule(i.e.)Genderprediction.

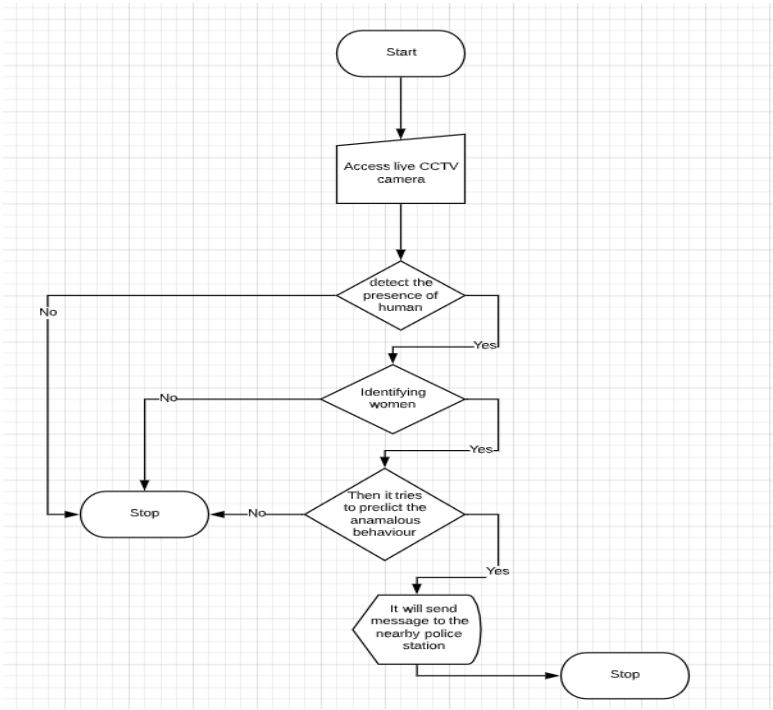


Fig 1.Flowchart for Women Safety Project

DesignStep5: It willbeidentifyinganywomenis there or not.

Step6: Thenit willbelookingforanomalousactivity.

Step7: Ifanyabnormalactivityisfound,thenthedevicewillsendawarningtothenearbypolicestationorcontrolroom.

A. HUMANDETECTION

Human categorization technique was divided into three categories: shape-based, motion-based, andtexture-based. However, the diction of the human frame and the variations in located viewpoints result in ahugequantityoftheobject'sviableappearances,makingitdifficulttoproperlyclassifyamovinghumanfromvarious shifting items using the entirely shape-based approach. Texture-based approaches, such as the use ofhighaspectcharacteristicsbyHOG,areexpectedontheedgesandSVMisusedtodetecthumanregions.Thisfeature descriptor can be done by using HOG algorithm in computer vision and image processing. The imageis split into a tiny, connected region called cells. A cell enclosed by many pixels and a HOG is made for eachof the

ISSN: 0975-3583, 0976-2833 VOL 06, ISSUE 01, 2015

pixel. The descriptor has histogram of the gradient of each and every pixel. For excessive accuracy, theHOG is normalized, which is carried out by calculating the depth over the larger vicinity of cells known asblockcells,afterwhichthecostacquiredisusedtostandardizeallcellswithinthatblock.Thestandardized

result gives enhanced accuracy deviation in illumination and intensity. HOG descriptors have a few blessingsover different descriptors consisting of it is invariant to geometric and photograph metric alterations exceptobjectorientation.Itisafarmainlyapplicableforhumandetectioninlivestream,videosandphotographyetc.

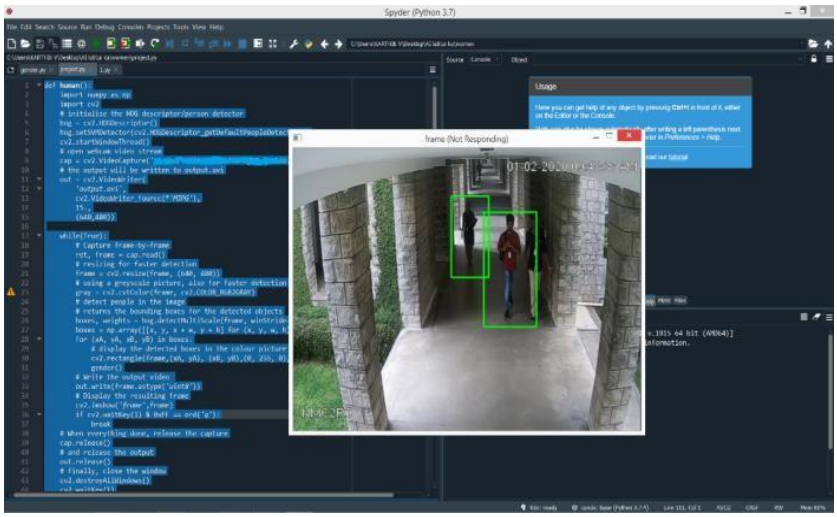
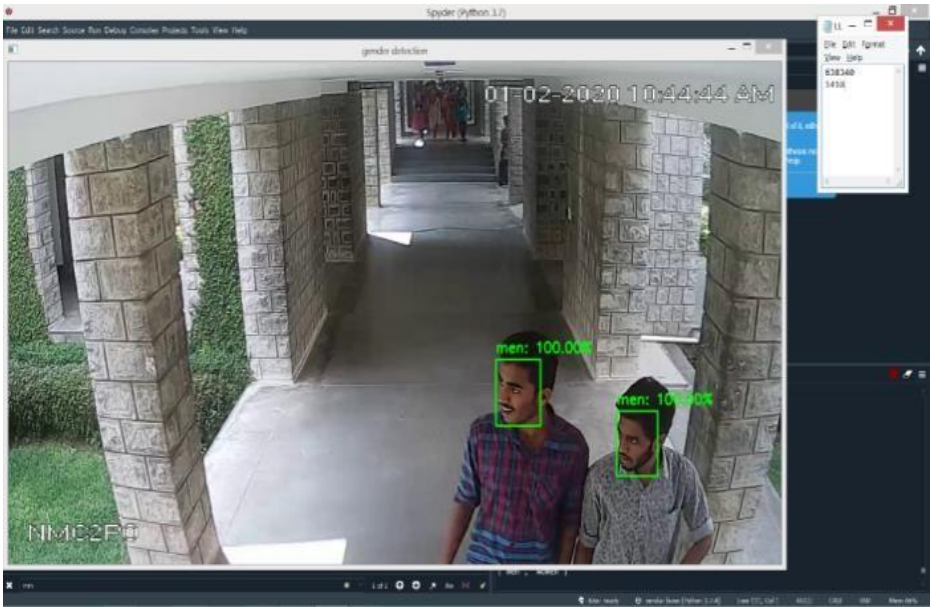


Fig2.Human Detection

B. GENDERPREDICTION

OnsuccessfulIdentificationanddetectingthehumanmovementitwillbetryingtopredictthegenderof the detected humans. When, in fact, a woman is standing alone in a train station or some other open spot,the CCTV camera observes at night time and the warning system would warn and transmit alert messagesthrough police headquarters to the nearby.It will be very helpful for women to go outside bravely especiallyduring night times.detectMultiScale():whichdetectsexactly whatyouneed.detectMultiScale (image,scaleFactor,minNeighbors).

Fig3.Genderprediction



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C. ANOMALOUSACTIVITYDETECTION

In case, assume that there are many women standing in a public place. It will be considered a normalactivity and, at that time, if the message is delivered to the nearby police station, it can be labeled as spam.Therecomesathirdmoduletoovercomethis.Inthisifmanywomenarespotted,weareusingthethirdmodule.Ifap roblemarisesaspertheabovecondition,thealgorithmwilllookforanunusualactivity,suchasrunning,etc. If anysuch kindof motion is detectedthe alarmmessage canbeshiptothecloseby policestation.

Theproposedalgorithmdetectsanomalybehaviorsbyusingonlyfeeblylabelledvideosforpreparation. This indicates a loss in the MIL ranking with smooth restriction for a deep learning network todiscovervideo segmentswith anomalies.

Model training consists of 32 video segments with functions computed using C3D in each bag. As areferencetool,ouralgorithmalsousesabinarySVMclassifierandtreatsalltheanomalousvideosasonetype,andregul arvideos as anothercategory.

C3Dpatternscomputeeveryvideoandbinaryclassifiertrainalinearkernel.Thisclassifiergiveseachvideocli pthe possibilitytobe anomalousfor testing.

Advantages:

- Helptoimprovesafetyofwomen.
- Helpreducecrimeagainstwomen.
- Helppolicetotakeimmediateactionagainst criminals.
- Doesnot requireanyspecial tool.

Fig4.Abnormalcrowdactivity

4. IMPLEMENTATIONANDRESULTS

Thelowerpercentileoftheedge,thehigherthequantityofcellswegroupasdangerousandourmodelprecision will be higher. Our calculation needs to locate the ideal harmony between hazard order and modelprecisiontogetthebestexperience.Anunchangeableviewwithalowerlimitwouldpromptahighnumberofrigh t groupings and yet it might prompt some off-base recognition for the clients that make the wholecalculation as a disappointment model. On the opposite side if we raise an excess of the percentile, we wouldbarelyclassifyafundamentalspotandcausinginerror:falsenegative.Actually,reliantupontheextentittakesin the media it may be the end for the created model to help individuals. The False Negative ought to beconsideredoverwhiledoingthemodelassessment.Ourmodelhasanaccuracyof80percentages.

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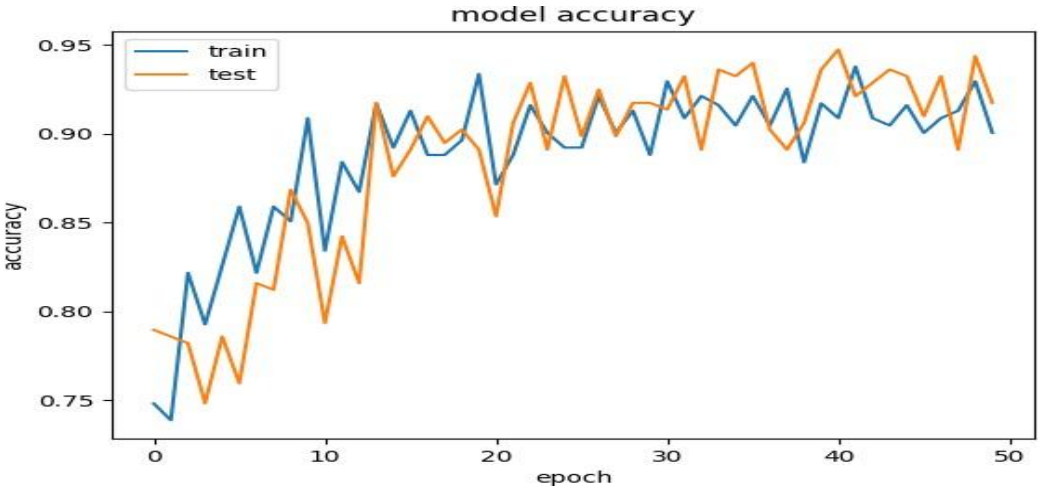

Fig 5. AccuracyGraph

5. CONCLUSION

Ourprojectwillhelpbothstateaswellascentralgovernmentsinminimizingtheircostsforwomensafety.Ourproje ctwillalsohelppeopleespeciallywomeninminimizingtheircostfortheirsafetylikethe requirement of an android application and smart watch and some other additional requirements. A lot ofhelpline contacts have been made with the rest of the years, but they are all a cure for the harassment thathas already occurred and no longer the prevention that we need. There are many pre-existing apps thatprovide alert notification to stored contacts, but none of them are powerful and, according to the survey,existing technology does not make poor women feel safe. So, we hope that our technology will be moreefficient andquickerenough and willbringhope towomen.

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