International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 6 June 2022, pp: 1876-1881 www.ijaem.net ISSN: 2395-5252

Face recognition System Using Open Cv Python

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Submitted: 15-06-2022 Revised: 20-06-2022 Accepted: 25-06-2022

ABSTRACT
As We all knew about the how much important technology in our daily life and in every field as digital communication, medical, space and other industries. In this project we are discussing about the face recognition and attendance methods.face recognition is basically a is mathematical calculation a different faces by using OpenCV Python .The face is one of the easiest ways to separate each other personal identities.Human faces process basically consists of two steps. First stage faces detection when object is a short distance and the second step identifies the person from the face.And uses different technology like PYTHON, OPENCV, NUMPY, PANDAS,HAAR CASCADE in face recognition system.As a result, it is able to detect person and there faces by different technology, sofurther enhancement in the project there a very useful in different industries and it makes our work more effortless.

Keywords: Face Recognition, Haar cascade,OpenCV, PYTHON.

I. CHAPTER-1 INTRODUCTION

1.1.SCENARIO OF FACE RECOGNITION SYSTEM:

Some biometric innovations are stimulating our imaginations, such as facial recognition.Likewise, her appearancesparkedhugeproblemsandbeautifulrespon sesin2019andearly2020.Facialrecognitionistheway ithedirectionofrecognizingorconfirminganindividua l'spersonalityusingtheirface.

Capture, investigate and analyze based projects. Today it is considered by far the mostordinary biometric measurement. Furthermore, for a valid justification, we recognizeourselves not through the search for fingerprintsoriris, forexample, butwiththehelpoflookingatourfacesonthedetailsofth eindividual'sface.Thisisduetothe fact that it is something but difficult to realize and actualize. No physical communicationisrequiredthroughthe endcustomer,furthermore,thefacialrecognitionandfa cematchingproceduresforidentityconfirmation/proo farefast.

1.2. LITERATUREOVERVIEW

Afacerecognitionsystemisbestforrecognizi ngorconfirmingapersonbasedonacomplicatedpicture or videoframefromavideosource.Therearemanystrategi esformakingfacialrecognitiondeviceswork,and yet they typically work by finding selected facial highlights from a particular image of facesthat are ina database. It is also defined as an application based on biometric artificialintelligence that can uniquely distinguishapersonbystudyingpatternsbasedprimaril yontheindividual'sfacialstructuresandshapes.

1.3. AIMOFTHEPROJECT

Inthisproject, wewillmakeaprojectwhichisaPython-basedfacerecognitionsystemthatcanfindaperson'sfac eaccordingtothebasictexturesandanindividual'sfaces hape.Thisprojectcancomeinhandyforsecurityreasons anditgenerates analert.Intoday'sworldfull oftechnologicalintelligence, weavesecurity cameras, but the disadvantage ofthistypeofsecurityisthatwerecognizethecrimeafter thecrime is completed because we have cameras, but there are still people we work on,especiallyinsmallenterprisesandhomes,butifwep utanyoperatorthenthiswillrequire.

II. CHAPTER-2. FACE RECOGNITION SYSTEM AND ALERT GENERATOR USING OPEN CVPYTHON

2.1. INTRODUCTION:

Themostcommonbiometricmethodusedtorecognize peopleistheirface.Facialrecognitionhasbeengivenam pleattentionbythefacetracking,airport,forensic,crimi naldetection,etc.Comparedtootherbiometricssuchasfi ngerprint, iris andhandprintetc.Facialbiometricscannotbeintrusive. Allofthiscanbedonewithouttheusersknowledge and can also be used for security-based applications such as airport security,

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crimedetection,facetrackingandforensicsurveillance systems.

2.2. TECHNOLOGIESUSED:

2.2.1. PYTHON:

Pythonisahigh-levelprogramminglanguagewithdynamicconnotations.Itisaguidedlanguageaswellasaninterpretedlanguage.Createdbyhigh-leveldatastructureswithacombinationofdynamicwriting anddynamiclinkingmakingitveryattractiveforprogrammingandrapidapplicationdevelopmentandalsoforglue language to link existing components together. Python is a simple and easy-to-learnLanguagethatemphasizesreadabilityandthusalsoreducessoftwaremaintenancecost.

2.1.1. OPENCV:

OpenCVi.e.(Open-SourceComputerVisionLibrary)isnothingmorethana multiplatformlibrarywhichis usedtodeveloprealtimecomputervisionapplications.Itsmainobjectiveistoanalyzefeaturessuchasface detectionandobjectdetection,aswellasimageandvideocaptureprocessing.Itisalibraryofmachinelearningsoftwarethatcanprovideuswiththecommoninfrastructureformachine learningalgorithmsaswellasforcomputervision.

2.1.2. NUMPY

ThecompletemoduleforNumPyis"NumericalPython",whichisaPythonpackage.Wecanconsideritas the main library for scientific computing which contains a powerful n-dimensional array object and also providestoolsforintegratingC,C++etc.

2.1.3. PANDAS:

Basically, pandas is a software library in computer programming. It is mainly written as it will be in the Python programming language. To deal with manipulation and data analysis, it is used in Python. Pandas helpsusmanipulateandorganizethedatabyputtingitintabularform.Thispackageisthemainanalytics tool and is available to data scientists working in Python today. We can say that this tool is essentiallythe homeofourdata.

2.1.4. HAARCASCADE:

HaarCascadeisbasicallyaclassifierusedtodistinguishtheitemsforwhichithasbeenprepared,fromthe source.TheresultisanXMLrecordthatstoresthetrainedresults.Wheneverthisissaidinessence,theHaar waterfallispreparedbyoverlayingthepositiveimageontopofmanynegativeimages.Preparationrequiresa high specification system and a good Internet connection and a large number of training images, which is whyitiscompletedontheserver.Toincreasetheefficiencyoftheresults,theyusehighqualityimagesand increase the number of steps the classifier is prepared for. We need a cascading frontal face recognition systemtoidentifythefacefromourwebcam."

2.2. FACE RECOGNITION SYSTEM ANDITS WORKING:

2.3.1.FACE RECOGNITION SYSTEM:

The method basically requires every device that has digital photo technology to generate and call up the imagesanddata-relatedimportantinformationandtorecordthebiometricfacialpatternofthepersontobe identified. The face recognition system consists of four modules, namely face recognition, face normalization, facial feature extraction, and adjustment. The face recognition process can be done for face verification, face identification, and face monitoring (Tracking, surveillance).

To make a complete project on Face Recognition, we have to work on three very distinct phases:

(1) Data Gathering and FaceDetection
(2) Train theRecognizer
(3) FaceRecognition

2.3.1.1. FACE DETECTION:

"Facedetectionisthefirstlevelintheidentificationprocess.Itisconsideredaclassificationoftwoclasses (face versus non-face). Facial recognition from an image or video as follows, it may be subject to unique limitations,forexample,brightnessissue,currentvarieties,learningblockages,geometricmodeling,Hough TransformandTemplateMatchaccessories,etc.

2.3.1.2 FEATUREEXTRACTION:

Theextractionoffacialfeaturesistheprocedureinwhichthefunctionsoffacialcomponentssuchaseyes, nose,mouth,etc.areextractedfromtheimageofthehumanface.Forinitializationofprocessingtechniques this is very important, which includes face tracking, facial expression recognition, and facial recognition.

Amongallthecharacteristics,thelocationanddetectionofeyesisimportantfromwhichtheplacesofallthe different facial features areidentified.

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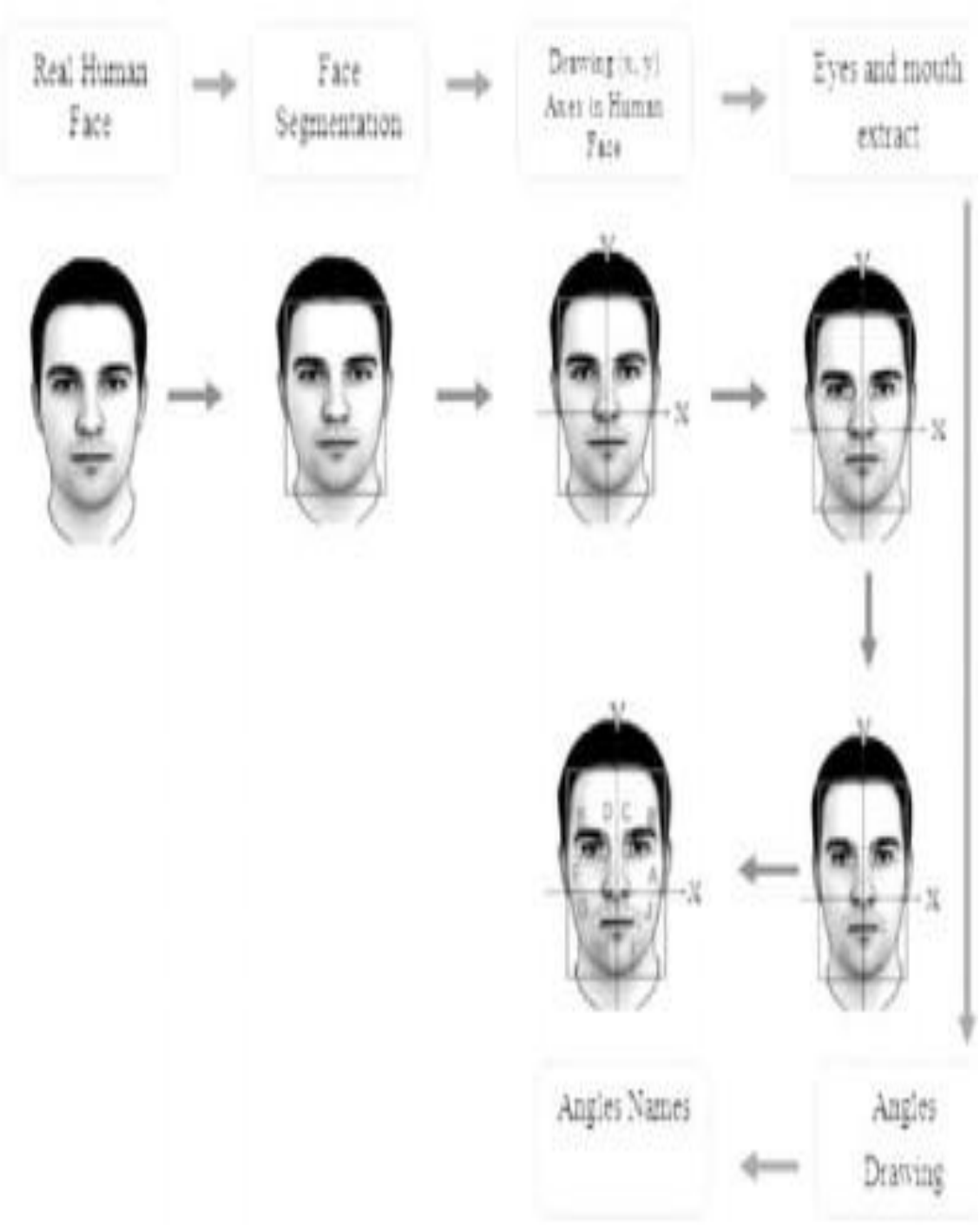
Figure 2.3.3 Process of Feature Extraction



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2.3.1.3 FACERECOGNIZER

Inthissection,wewillfinallyhavethefacepred iction.Wecanalsosaythatitwillcaptureanewfaceonour digital camera and if this person has already acquired and trained previously, our recognizer will make a "Prediction"givinghimbackhisidentityandanindexsh owinghowsafetherecognitioniswiththismatch.

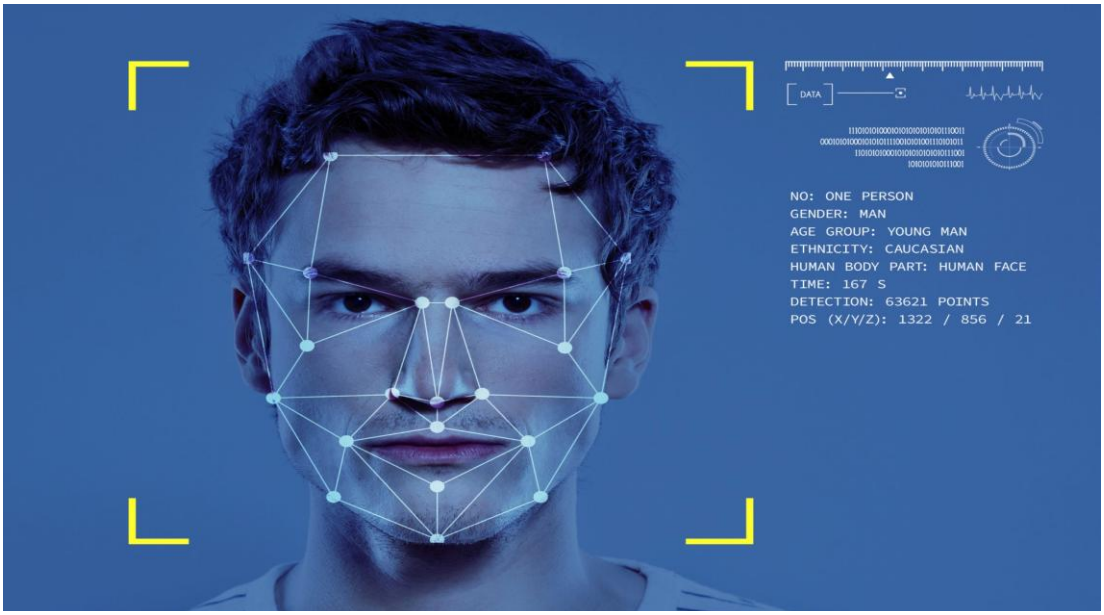

Figure 2.3.4 Recognized Face

2.3.2.:WORKING

Captureaphotoofyourfacefromavideoorpho to.Thefacecanbeseensingleormaybeincrowd,andyou r photowillappeardirectlyinfrontofyouoritmaybealmo stinprofile.
Theprogramrecognizesthegeometryofyourface. Themainfactorsarethegapfromyourforeheadtoyour chin and the distance between your eyes. The program identifies facial features, that is, one system can identify68ofthemandthisisthekeytodistinguishingyo urface.

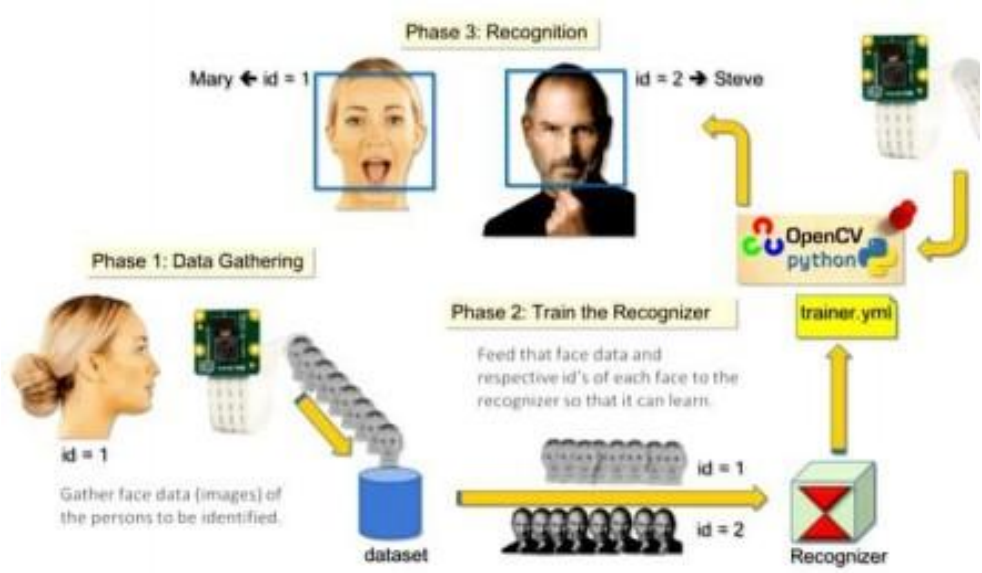

Figure 2.3.5 Working of Face Recognition System

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TESTING ANDDEPLOYMENT:

Testing process is completed using PYCHARM SOFTWARE. And all the source code has been run to check whether the face recognition system is working or not. PYTHON 3.7 is used (under which many librariesarepresentsuchasopencvetc.)Testingwillbed onefromthesourcecodeofdatabase,trainingdata andrecognizer.

USINGPYCHARM:

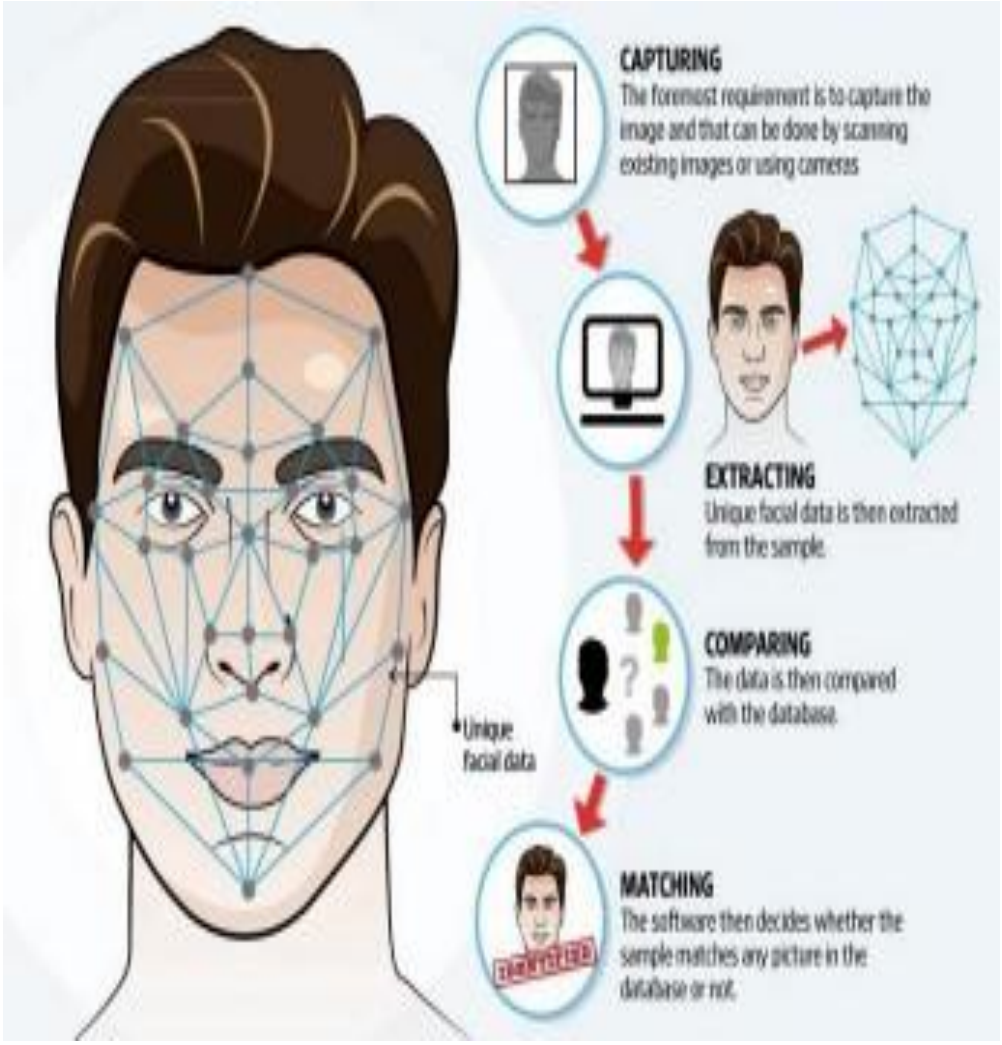
PYCHARMSOFTWAREisthefamousIDE(IntegratedDevelopmentEnvironment)usedforpython scriptinglanguage,thissoftwareisonewhichoffersexceptionalcapabilitiestoitsdevelopersaswell astoitscustomersinthefollowingmanner:

- Codeinspectionandcompletion
- DebuggingAdvanced

Support for frameworks and web programming and frameworks such as Django and Flask.

2.4 FINAL PROJECT

Figure 2.6.1 Examining Face Recognition



III. CHAPTER-3 CONCLUSION AND FUTURE SCOPE

3.1 CONCLUSION:

"Face recognition technology has made great progress over the last 20 years. Today, machines can automatically verify identity information, secure exchanges, for security and surveillance tasks, and to

controlaccesstobuildings,homes,etc.Health.Inanyca se,next-generationfacerecognitionsystemswill havewideapplicationinsmartenvironmentswhereco mputersandmachinesaregraduallybecomingthe same as usefulassistants."
Thisprojectproposesanothermethodologyforclassrec ognitionoffacialrecognitionandalertgeneration. Webuiltexpressionmodelsbyusingregular Bziercurve sfromseveralsubjects.Inthisproject,weworked onopencv,sckit-
learn,andtensorflow.Inthisproject,athird-orderBziercurvewasusedtooutlinetheface andexpression.TheadoptionofBziercubiccurvesinvo lvesonlyfourcontrolpointswhicharesufficientto represent acurve.
Despitethefactthatthisstrategywasimplementedforasmallnumberofpeopletheexperimentalresults inanycaseshowthatoursystemisrobustifthevideorepr esentsanoutstandingdisplayoffacesandthat these images are low-resolution. For the project, there is a lot of room to explore, for example by improving the security issue, evaluating the task of images captured from different angles and higher resolutions.

3.2 FUTURE SCOPE:

"The future of facial recognition technology is cool or it can be said bright. Forecasters believe that this technologyisbeingcountedontodevelopatanamazing rateandwillgeneratehugeincomesinthecoming years.Securityandsurveillancearethemainsectionsth atwillbeaffecteddeeply.Thevariousareasthatitis currentlyreceivingwithallitsheartareprivateindustrie s,publicbuildingsandopenschools.Itisestimated that it will likewise be adopted by retailers and banking systems in the coming years to preventfraudulent credit / debit card purchases and installments, especially those on the Internet. This innovation would fill loopholes in the largely insufficient password system. In the long term, robots that use facial recognition technologycouldalsobeattacked.Theycanbeusefulin endingtasksthatareimpracticalordifficultfora person tofinish."
Promisingresultsareachievedwithfaceregistrationerr orsandfasterturnaroundtime.Thesystemisfully programmed and can work with both video feeds and images. It is able to recognize spontaneous images. This system can be used with CCTV cameras where the image is only captured if the individual face is identifiedorifthepersonisunknowntooursystemanerr ororwarningissuddenlygenerated.Hepresents himself in security systems that can recognize a person in any kind of expression. Organizations and companies'parkinglotscanusethissystem

REFERENCES

[1]. www.datacamp.com
[2]. www.researchgate.net
[3]. www.electronicsforu.com
[4]. www.pyimagesearch.com
[5]. En.wikipedia.org
[6]. Dynamics of facial expression: Recognition of facial actions and their temporal Segments from face profile image sequences; M. Pantic and I. Patras, IEEE Trans.
Syst.,Man,Cybern.B,vol.36,no.2,pp.433449, 2006
[7]. NonverbalCommunication;A.Mehrabian, London,U.K.:Aldine,2007.
[8]. Seeing with OpenCV, Article, http://www.cognotics.com/opencv/servo_2007_series/part_1/index.html,Published by Robin Hewitt,2010.