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SELF MONITORING SYSTEM FOR VISION BASED APPLICATION USING DEEP LEARNING

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Abstract: Designing a system for automatic image content recognition is a non-trivial task that has been studied for a variety of applications such as face detection, face recognition, person identification. Face recognition is one of numerous presentations of digital image processing. Automatic face detection is a complex problem which is concerned with the automatic identification of an individual in a digital image. But there are no solutions to detect faces automatically with low resolutions in various applications scenario. We can implement this project computer vision system to predict the screens which are near to their vision or not. This can tiredness the eyes and place stress on the torso because the backrest is no longer provided that support. Viewing distances that are too short may cause eyes to work harder to focus (convergence problems) and may require sitting in awkward postures. For instance, user may tilt their head backward or push chair away from the screen, causing you to automatically type with outstretched arms. But there is no alert system for measuring distance from monitor to eye. The minimum distance is 0.38 m (1.2 ft.) and maximum distance is 1.02 m (3.3 ft.). It can be achieved by using artificial intelligence. We can use web camera for capturing human head positions and separate the background from foreground head positions. If the distance is minimum to pre-define threshold value means, alert is automatically generated and intimate to users without using any sensors. And also extend the approach to design the parent children framework to send alert at the time of seeing unwanted websites.

Keywords: Online Results, Quotation Paper, Online Attendants

I. INTRODUCTION

In imaging science, image processing is processing of images using mathematical operations by using any form of signal processing for which the input is an image, a series of images, or a video, such as a photograph or video frame; the output of image processing may be either an image or a set of characteristics or parameters related to the image. Most image-processing techniques involve treating the image as a two-dimensional signal and applying standard signal-processing techniques to it. Images are also processed as three-dimensional signals with the third-dimension being time or the z-axis. Image processing usually refers to digital image processing, but optical and analog image processing also are possible. This article is about general techniques that apply to all of them. The acquisition of images (producing the input image in the first place) is referred to as imaging. Closely related to image processing are computer graphics and computer vision. In computer graphics, images are manually made from physical models of objects, environments, and lighting, instead of being acquired (via imaging devices such as cameras) from natural scenes, as in most animated movies. Computer vision, on the other hand, is often considered high-level image processing out of which a machine/computer/software intends to decipher the physical contents of an image or a sequence of images (e.g., videos or 3D full-body magnetic resonance scans). In modern sciences and technologies, images also gain much broader scopes due to the ever growing importance of scientific visualization (of often large-scale complex scientific/experimental data). Examples include microarray data in genetic research, or real-time multi-asset portfolio trading in finance. Image analysis is the extraction of meaningful information from images; mainly from digital images by means of digital image processing techniques. Image analysis tasks can be as simple as reading bar coded tags or as sophisticated as identifying a person from their face.

Computers are indispensable for the analysis of large amounts of data, for tasks that require complex computation, or for the extraction of quantitative information. On the other hand, the human visual cortex is an excellent image analysis apparatus, especially for extracting higher-level information, and for many applications — including medicine, security,

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and remote sensing — human analysts still cannot be replaced by computers. For this reason, many important image analysis tools such as edge detectors and neural networks are inspired by human visual perception models. Image editing encompasses the processes of altering images, whether they are digital photographs, traditional photochemical photographs, or illustrations. Traditional analog image editing is known as photo retouching, using tools such as an airbrush to modify photographs, or editing illustrations with any traditional art medium. A popular way to create a composite image is to use transparent layers. The background image is used as the bottom layer, and the image with parts to be added are placed in a layer above that. Using an image layer mask, all but the parts to be merged are hidden from the layer, giving the impression that these parts have been added to the background layer. Performing a merge in this manner preserves all of the pixel data on both layers to more easily enable future changes in the new merged image.

II. LITERATURE REVIEW

In this work we show that a multi-loss deep network can directly, accurately and robustly predict head rotation from image intensities. We show that such a network outperforms landmark-to-pose methods using state-of-the-art landmark detection methods. Landmark-to-pose methods are studied in this work to show their dependence on extraneous factors such as head model and landmark detection accuracy. We also show that our proposed method generalizes across datasets and that it outperforms networks that regress head pose as a sub-goal in detecting landmarks. We show that landmark-to-pose is fragile in cases of very low resolution and that, if the training data is appropriately augmented; our method shows robustness to these situations. Synthetic data generation for extreme poses seems to be a way to improve performance for the proposed method as are studies into more intricate network architectures that might take into account full body pose for example

It requires no initialization, handles extreme rotations and partial occlusions, and efficiently registers facial surfaces. Numerous factors contribute to the success of our algorithm: the overlap term (Ec) in the cost function, the combined PSO and ICP algorithm, dynamically adapting the weights of the face model, and the adoption of a morphable face model. While these concepts have each been introduced individually in previous studies, the contribution of our work lies in combining these disparate ideas in an effective manner to significantly improve the accuracy of 3D head pose estimation. Our work also presents for the first time a systematic quantitative assessment of the contribution of each of these various factors in improving the accuracy of head pose estimation. Building upon the work of Qian et al. we also provide deeper insights into the working of the combined PSO and ICP optimization for 3D surface registration. To our knowledge, ours is also the first work to provide a comprehensive review and in-depth comparison of the existing state-of-the-art techniques for 3D head pose estimation on a common benchmark dataset.

In this paper, we put forward a new vector-based annotation and a new metric MAEV. They can solve the discontinuity issues caused by Euler angles. By the combination of new vector representation and our TriNet, we achieve state of-the-art performance on the task of head pose estimation. Then show that MAE may not reflect the actual behavior especially for the cases of profile views. To solve two problems, we propose a new annotation method which uses three vectors to describe head poses and a new measurement Mean Absolute Error of Vectors (MAEV) to assess the performance. We also train a new neural network to predict the three vectors with the constraints of orthogonally. Our proposed method achieves state-of-the-art results on both AFLW2000 and BIWI datasets. Experiments show our vector-based annotation method can effectively reduce prediction errors for large pose angles.

In this paper, we propose a new way to acquire more meaningful aggregated features with the fine-grained spatial structures. By defining learnable and non-learnable scoring functions of the pixel-level features, we are able to learn complementary model variants. Experiments show that the ensemble of these variants outperforms the state-of-the art methods (both landmark-based and landmark-free ones) while its model size is around 100× smaller than those of previous methods. Furthermore, its estimation on the yaw angle is even more accurate than those methods with multi-modality information such as the RGB-D or RGB-Time recurrent model. We show that it is possible to improve regression results by learning meaningful intermediate features. Although we only demonstrate on the pose estimation problem, we believe that the idea can be extended to other regression problems as well.

In this paper, we propose a robust and fast solution for head and shoulder pose estimation, especially devoted to drivers in cars, but that can be easily generalized to any application where depth images are available. The presented framework provides impressive results, reaching In this paper, we propose a robust and fast solution for head and shoulder pose estimation, especially devoted to drivers in cars, but that can be easily generalized to any application where depth images are available. The presented framework provides impressive results, reaching an accuracy higher than 73% on the new Pandora dataset and a low average error on the Biwi dataset, thus overcoming all state-of-art related works. The complete framework proposed in this paper merges together several modern aspects of computer

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vision. Among the others, the detection, localization, and pose estimation of the head and the shoulders on depth images have been included. In the following, we describe the state of the art of each mentioned topic, including the Domain Translation research area related to the Face-from-Depth module.

III. MATERIALS AND METHODS

A use case diagram at its simplest is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved. A use case diagram can identify the different types of users of a system and the different use cases and will often be accompanied by other types of diagrams as well.

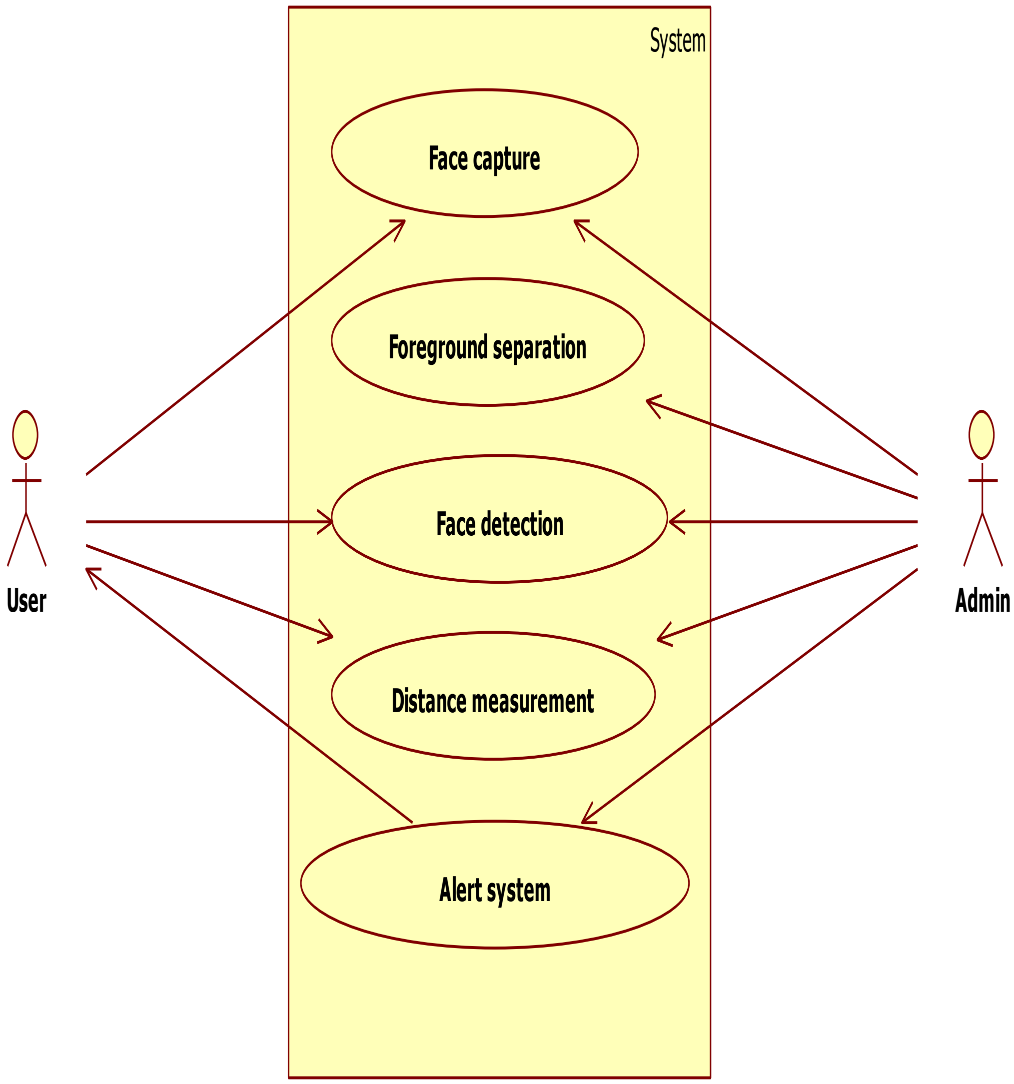

Figure 1: use case

IV. METHODOLOGY

A two-dimensional diagram explains how data is processed and transferred in a system. The graphical depiction identifies each source of data and how it interacts with other data sources to reach a common output. Individuals seeking to draft a data flow diagram must identify external inputs and outputs, determine how the inputs and outputs relate to each other, and explain with graphics how these connections relate and what they result in. This type of diagram helps business development and design teams visualize how data is processed and identify or improve certain aspects.

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A. architecture diagram

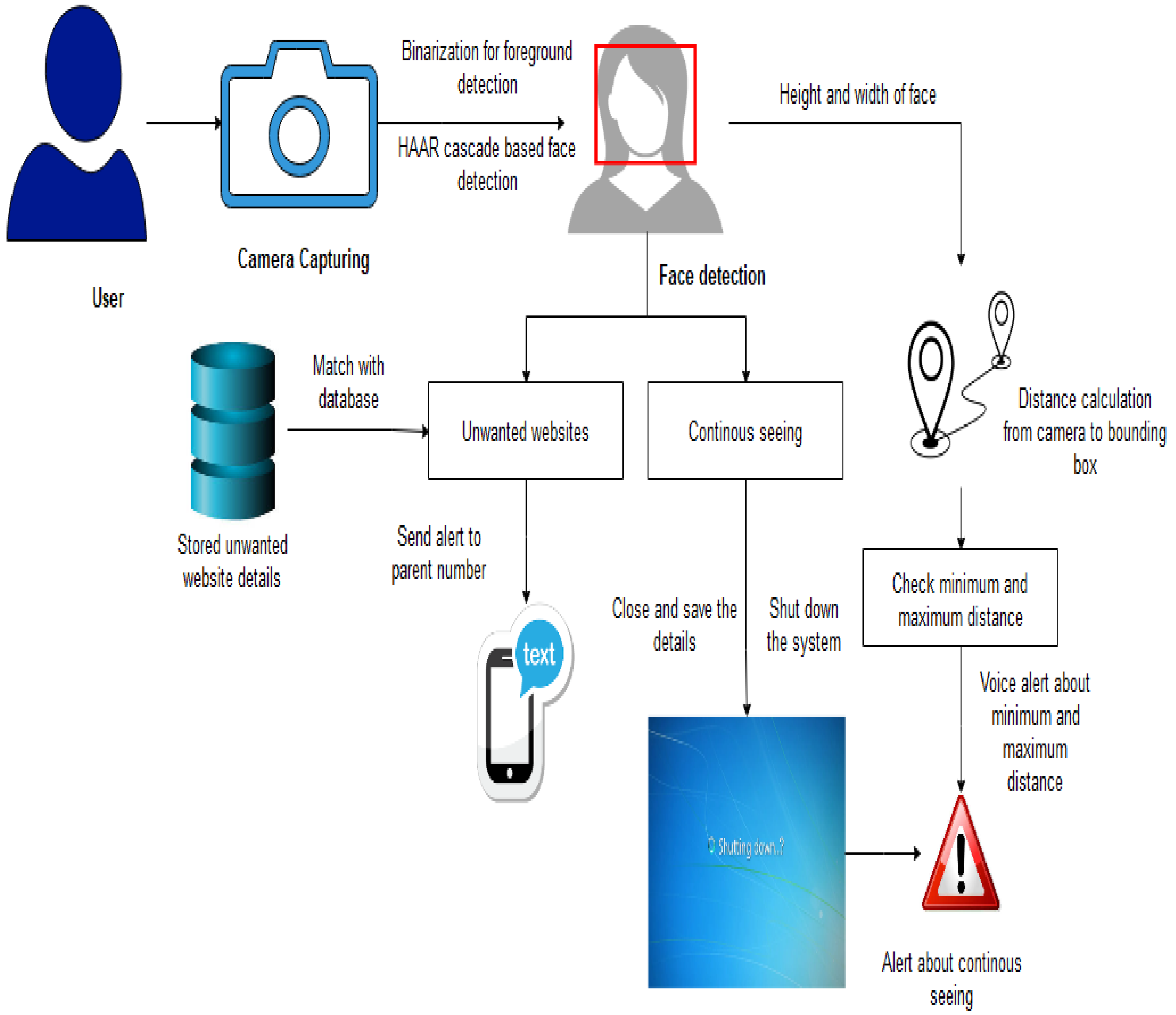

Figure 2: architecture diagram

B.CLASS DIAGRAM

The class diagram is a static diagram. It represents the static view of an application. Class diagram is not only used for visualizing, describing and documenting different aspects of a system but also for constructing executable code of the software application. The class diagram describes the attributes and operations of a class and also the constraints imposed on the system. The class diagrams are widely used in the modeling of object oriented systems because they are the only UML diagrams which can be mapped directly with object oriented languages.

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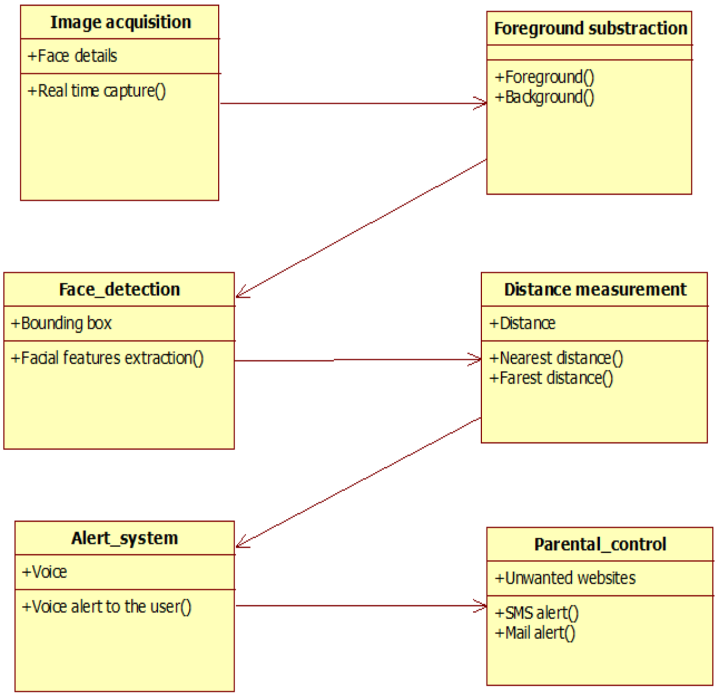

IMAGE ACQUISITION: The first stage of any vision system is the photo acquisition stage
FOREGROUND SUBTRACTION: Background subtraction, also recognized as foreground recognition
FACE DETECTION ALGORITHM: Automatic face detection is a complicated trouble in photo processing

C. Implementation
I]. Input design:

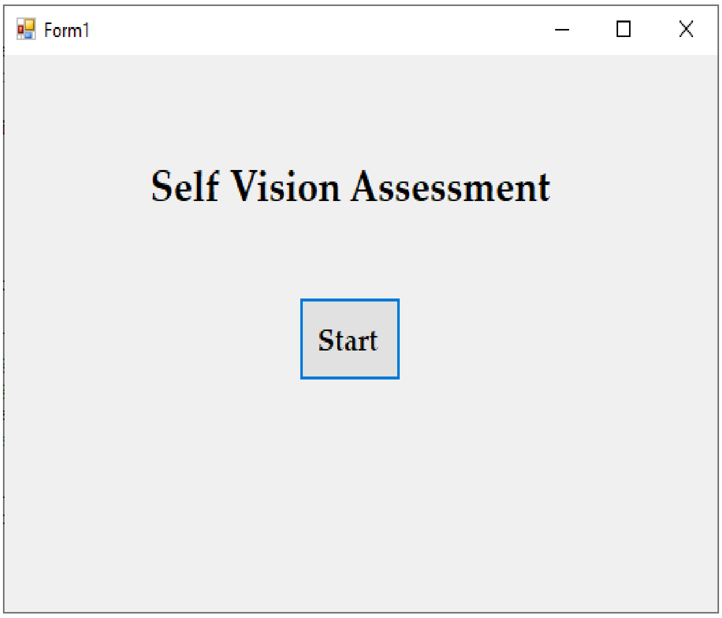

Figure 3: HOME PAGE

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coding

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Windows.Forms;
using System.Data.SqlClient;

namespace EyeiresBased_AttendanceSystem
{
public partial class AdminHome : Form
{

SqlConnection con = new SqlConnection(@"Data Source=.\SQLEXPRESS;AttachDbFilename=I:\NewProject2022\ENG\DSEC\Selfvision\Selfvision\selefdb.mdf;Integrated Security=True;User Instance=True");
SqlCommand cmd;

public AdminHome()
{
InitializeComponent();
}

private void button1_Click(object sender, EventArgs e)
{
cmd = new SqlCommand("insert into urltb values('" + comboBox1.Text + "')", con);
con.Open();
cmd.ExecuteNonQuery();
con.Close();

cmd = new SqlCommand("select * from urltb", con);
SqlDataAdapter da = new SqlDataAdapter(cmd);
DataTable dt = new DataTable();
da.Fill(dt);
dataGridView1.DataSource = dt;
dataGridView1.Refresh();

}

private void comboBox1_Enter(object sender, EventArgs e)
{
con.Open();
cmd = new SqlCommand("select * from urltb ", con);
SqlDataReader  dr = cmd.ExecuteReader();
while (dr.Read())
{
comboBox1.Items.Add(dr["url"]);
}
con.Close();

}
```

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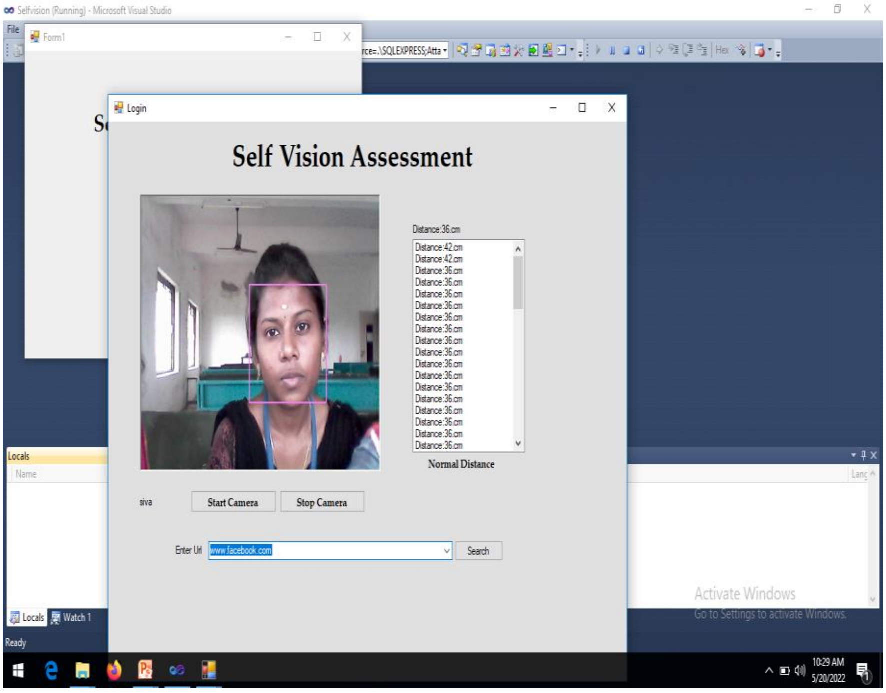

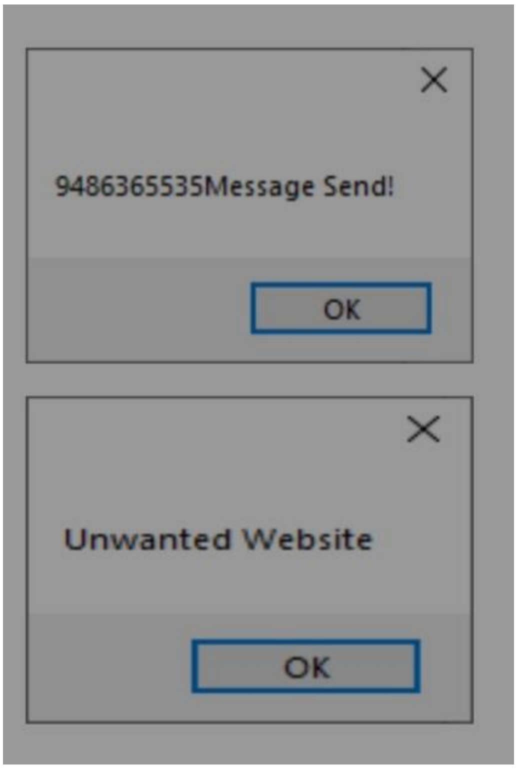

Figure 4: Output

V. RESULTS

Pseudo Code/Sequence of Micro Operation/Flowcharts

using System;

A. using System.Collections.Generic;

B. using System.ComponentModel;

C. using System.Data;

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```
D.      using System.Drawing;
E.      using System.Text;
F.      using System.Windows.Forms;
G.
H.      namespace EyeiresBased_AttendanceSystem
I.      {
J.      public partial class Home : Form
K.      {
L.      public Home()
M.      {
N.      InitializeComponent();
O.      }
P.
Q.      private void button2_Click(object sender, EventArgs e)
R.      {
S.      Login l = new Login();
T.      l.Show();
U.      this.Close();
V.      }
W.
X.      private void button1_Click(object sender, EventArgs e)
Y.      {
Z.      NewUser nn = new NewUser();
AA.     nn.Show();
BB.     this.Close();
CC.     }
DD.
EE.     private void button3_Click(object sender, EventArgs e)
FF.     {
GG.     AdminHome ah = new AdminHome();
HH.     ah.Show();
II.
JJ.     }
KK.     }
LL.     }
MM.
NN.     using System;
OO.     using System.Collections.Generic;
PP.     using System.ComponentModel;
QQ.     using System.Data;
RR.     using System.Drawing;
SS.     using System.Text;
TT.     using System.Windows.Forms;
UU.     using Emgu.CV.UI;
VV.     using Emgu.CV;
WW.     using Emgu.CV.Structure;
XX.     using Emgu.CV.CvEnum;
YY.     using System.IO;
ZZ.     using System.Diagnostics;
AAA.    using AForge;
BBB.    using AForge.Imaging;
CCC.    using points = System.Drawing.Point;
DDD.    using AForge.Imaging.Filters;
EEE.    using System.Data.SqlClient;
FFF.
GGG.    namespace EyeiresBased_AttendanceSystem
HHH.    {
III.
```

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```
JJJ.
KKK.    public partial class InputName : Form
LLL.    {
MMM.
NNN.
OOO.    SqlConnection con = new SqlConnection(@"Data Source=.\SQLEXPRESS;AttachDbFilename=I:\NewProject2022\ENG\DSEC\Selfvision\Selfvision\selefdb.mdf;Integrated Security=True;User Instance=True");
PPP.    SqlCommand cmd;
QQQ.
RRR.    public string userName;
SSS.
TTT.
UUU.
VVV.
WWW.  public InputName()
XXX.    {
YYY.    InitializeComponent();
ZZZ.    }
AAAA.
BBBB.  private void button1_Click(object sender, EventArgs e)
CCCC.  {
DDDD.
EEEE.
FFFF.
GGGG.
HHHH.
IIII.
JJJJ.
KKKK.
LLLL.
MMMM.
NNNN.  this.Close();
OOOO.  }
PPPP.
QQQQ.  private void textBox1_TextChanged(object sender, EventArgs e)
RRRR.  {
SSSS.    //userName = textBox1.Text;
TTTT.  }
UUUU.
VVVV.  private void InputName_Load(object sender, EventArgs e)
WWWW.          {
.          //grabber = new Capture();
XXXX.  //Application.Idle += new EventHandler(FrameGrabber_Standard);
YYYY.  //pictureBox1.Image = bmp;
ZZZZ.
AAAAA.
BBBBB.//label9.Text = userName;
CCCCC.}
DDDDD.
EEEEE. private void pictureBox1_Click(object sender, EventArgs e)
FFFFF.  {
GGGGG.          //try
HHHHH.          //{
IIIII.
JJJJJ.    //    currentFrame = new Image<Bgr, byte>(bmp);
KKKKK.          //    pictureBox1.Image = currentFrame.ToBitmap();
LLLLL. //    gray_frame = currentFrame.Convert<Gray, Byte>();
```

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```
MMMMM.
NNNNN.     //  //Face Detector
OOOOO.     //      MCvAvgComp[][] facesDetected = gray_frame.DetectHaarCascade(Face, 1.2, 10,
Emgu.CV.CvEnum.HAAR_DETECTION_TYPE.DO_CANNY_PRUNING, new Size(50, 50));
PPPPP.
QQQQQ.     //  //Action for each element detected
RRRRR.//   foreach (MCvAvgComp face_found in facesDetected[0])
SSSSS.  // {
TTTTT.
UUUUU.     //      result = currentFrame.Copy(face_found.rect).Convert<Gray, byte>().Resize(100, 100,
Emgu.CV.CvEnum.INTER.CV_INTER_CUBIC);
VVVVV.
WWWWW.     //   pictureBox1.Image = result.ToBitmap();
XXXXX.
YYYYY.
ZZZZZ. //  }
AAAAAA.
BBBBBB.    //      MCvAvgComp[][] eyeDetected = gray_frame.DetectHaarCascade(eye, 1.2, 10,
Emgu.CV.CvEnum.HAAR_DETECTION_TYPE.DO_CANNY_PRUNING, new Size(50, 50));
CCCCCC.
DDDDDD.
EEEEEE.    //  foreach (MCvAvgComp eye_found in eyeDetected[0])
FFFFFF.//  {
GGGGGG.
HHHHHH.
IIIIII.
JJJJJJ.  //        result = currentFrame.Copy(eye_found.rect).Convert<Gray, byte>().Resize(100, 100,
Emgu.CV.CvEnum.INTER.CV_INTER_CUBIC);
KKKKKK.
LLLLLL.    //   pictureBox2.Image = result.ToBitmap();
MMMMMM.
NNNNNN.
OOOOOO.
PPPPPP.//  }
QQQQQQ.
RRRRRR.    //}
SSSSSS.//catch (Exception ex)
TTTTTT.    //{
UUUUUU.    //  // MessageBox.Show(ex.ToString());
VVVVVV.
WWWWWW.
XXXXXX.    //}
YYYYYY.    }
ZZZZZZ.
AAAAAAA.   private void label3_Click(object sender, EventArgs e)
BBBBBBB.   {
CCCCCCC.
DDDDDDD.   }
EEEEEEE.
FFFFFFF.   private void textBox1_TextChanged_1(object sender, EventArgs e)
GGGGGGG.   {
HHHHHHH.   userName = textBox1.Text;
IIIIIII.
JJJJJJJ.  }
KKKKKKK.
LLLLLLL.
MMMMMMM.  }
NNNNNNN.   }
```


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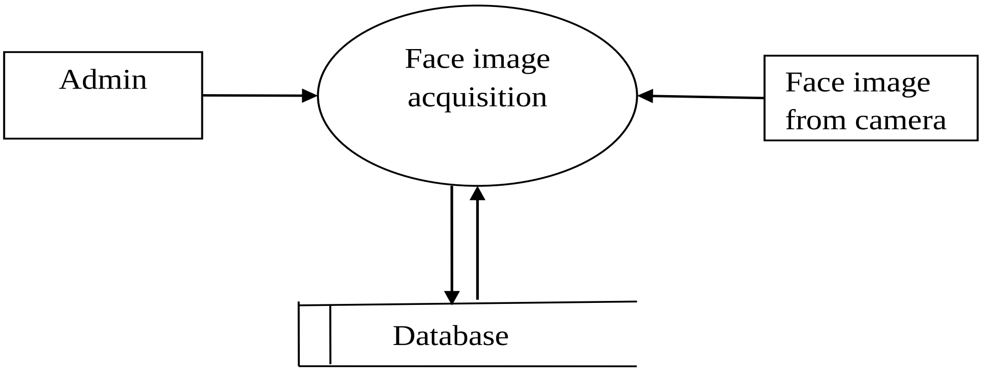

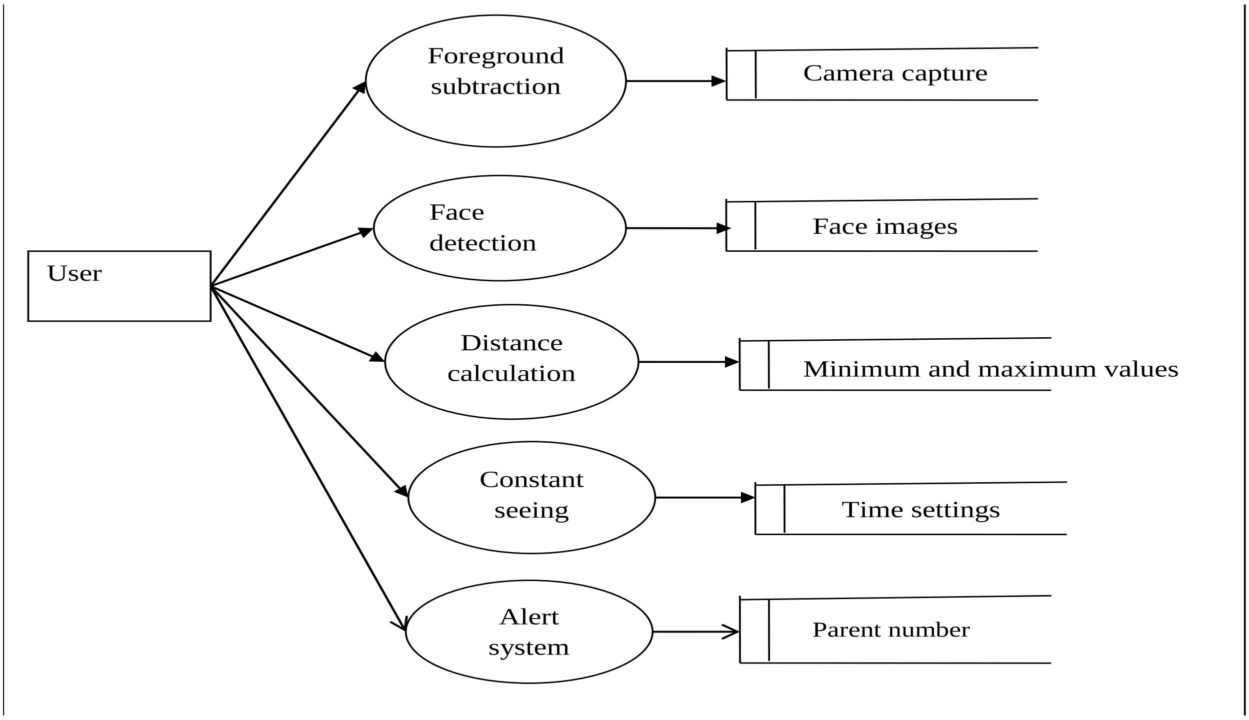

Figure 5: Flow Chart

FUTURE ENHANCEMENT

In future we can extend the system to implement various face detection algorithms to improve the accuracy of the system and implement in different scenarios. We can also implemented in various types monitors

CONCLUSION

Convergence is when the eyes turn inward towards the nostril while we view close gadgets. Convergence permits the image of the gadgets to be projected to the identical relative vicinity on each retina. Without accurate convergence, we see double photos. The closer the gadgets, the greater the stress on the muscles that converge the eyes. The visual machine also has a resting factor of vergence (RPV). It is similar to the resting point of accommodation, but it's the gap at which the eyes are set to converge while there may be no object to converge on. It's additionally known as darkish vergence. It is difficult to set a specific limit for a minimum viewing distance. If sustained viewing closer than the resting point of vergence contributes to eyestrain, perhaps we must say that eye-display distance should now not be closer than the resting factor of vergence. In this assignment we may be implemented the gadget to using photo processing techniques to detect the faces from digital camera capturing. Then successfully music the faces and to provide bounding boxes on face pictures. Finally set the gap limits to discover whether or not the individual is close to

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the device or not. And also calculated the person regular seeing conditions and undesirable internet site get entry to. This device can be beneficial to all aged peoples in various packages such as gaming applications, venture works and so on.

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