PRODUCT MANUAL (VIDEO)

Technical Report

Version 2.0

ATTACHED FILE

Attached file

- 1.Age.avi
- 2.captcha.avi
- 3.FR.avi
- 4.Fire.avi
- 5.Smoke.avi
- 6.LPR.avi
- 7.FR(Image).avi
- 8.EyeMonitor.avi
- 9. FaceRecog.avi
- 10.Abnormal Motion Detection.avi
- 11.Respiration Rate Measurement.avi
- 12.Heart Count.avi
- 13.LedCounter.avi
- 14.PhoneDetection.avi
- 15.TMD.avi
- 16.Front People Counting.avi
- 17.Side People Counting.avi
- 18. detect object in rect.avi

1. OUTLINE OF DEVELOPING PRODUCTS

Our developing team developed and applied different programs such as artificial intelligence(AI), image processing, communication and database management system, homepage making, reverse analysis and etc.

This is the simple introduction of products for every field.

- Artificial Intelligence(AI) Technology

  It uses Tensor flow 12.0 and Caffe frameworks with Deep Learning technology. Currently, with Deep Learning technology, sex, age and emotion recognition products using human face were developed and sex and age products are known to be well satisfied.

- Image Processing Technology

  The current image processing technology developed by the production team are applied in recognition fields such as FR, LPR, Captcha, fingerprint and counting fields such as number of vehicles and people, population density and object detection and tracking.

  Beside deep learning technology mentioned above, other various learning technologies and image learning methods such as SVM, Adaboost are applied in recognition, counting and detection. This technology is applied in abnormal motion detection, respiratory rate measurement, heart count and other medical products referenced in world-wide research theories.

- Communication and database, various management system production

  It produced different communication and data management programs using MSSQL, MYSQL, oracle, mdb databases.

- Homepage Making

  Homepages can be created by using PHP (CodeIgniter3.16 and Zend, Laravel framework), JSP, ASP.

- Reverse Analysis

  Reverse analysis can be executed on all language-based programs

2. INTRODUCTION OF DEVELOPED PRODUCTS

- 2.1 Sex and Age Estimation Program
- 2.2 Captcha
- 2.3 Face Recognition(video player capture mode) (FR)
- 2.4 Fire Detect Program
- 2.5 Smoke Detect Program
- 2.6 License Plate Recognition (LPR)
- 2.7 Face Recognition Program (image mode)
- 2.8 Eye Monitor Program
- 2.9 Face Recognition Program(camera mode)
- 2.10 Abnormal Motion Detection Program
- 2.11 Respiration Rate Measurement
- 2.12 Heart Count Program
- 2.13 Led Count Program
- 2.14 Phone Detection Program
- 2.15 TMD Program
- 2.16 People Counting (Front)
- 2.17 People Counting (Side)
- 2.18 Area Monitoring Camera

2.1 SEX AND AGE ESTIMATION PROGRAM

- Operation environment

  This program works in system above Windows 7, 64Bit system.

- Technical details

  Detect sex and age using Deep Learning Technology.

  To apply deep learning technology, we used Tensor flow framework and carried out research based on sample of 4,000 people (over 10 photo and personal data).

- Instruction (Video Content 1.Age.avi)

  First click open button and select folder of photos.

  Photo files are displayed in the list. Select the detected file.

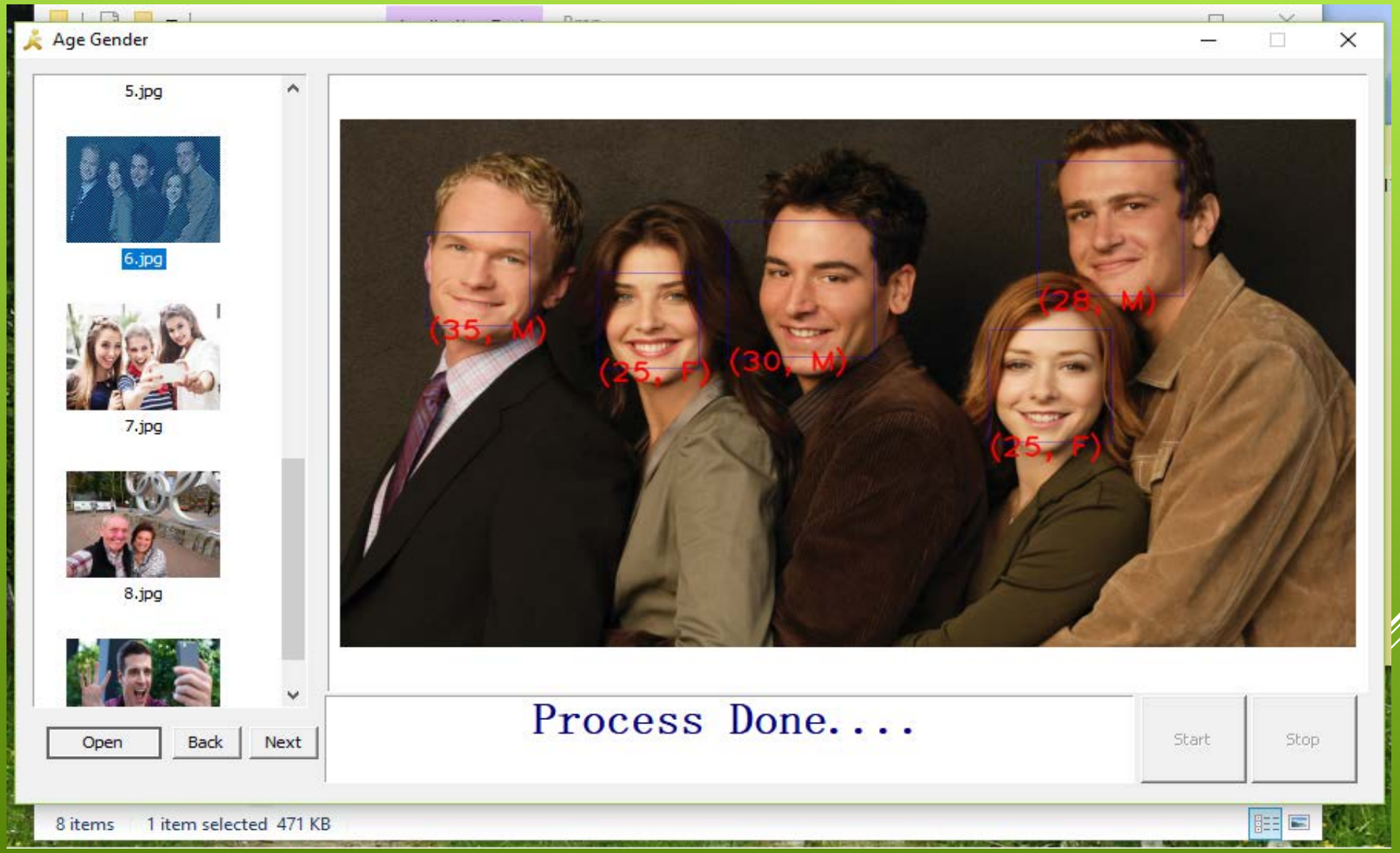
  Loading hundreds of megabytes of learning materials every time takes long time after clicking the button.

  Functions are shown only as it is a demo version and please keep in mind that the speed can be quickened.

  In camera version, detection is carried out in real time, thus the speed can be faster.

  Once camera is connected, press start button, and it detects sex and age of people in the camera. Since it's in the demo version, we didn't pay attention to the speed. The speed is faster in the camera version.

  In these two versions, when the photo file is selected or the start button is clicked to on the camera, it may take time to load due to neural network initialization. The loading time differs according to the function.


Age Gender
5.jpg
6.jpg
7.jpg
8.jpg
(35, M)
(25, F)
(30, M)
(28, M)
(25, F)
Process Done....
Open
Back
Next
Start
Stop
8 items
1 item selected 471 KB

2.2 CAPTCHA

- Operation environment

  Works in any environment.

- Technical details

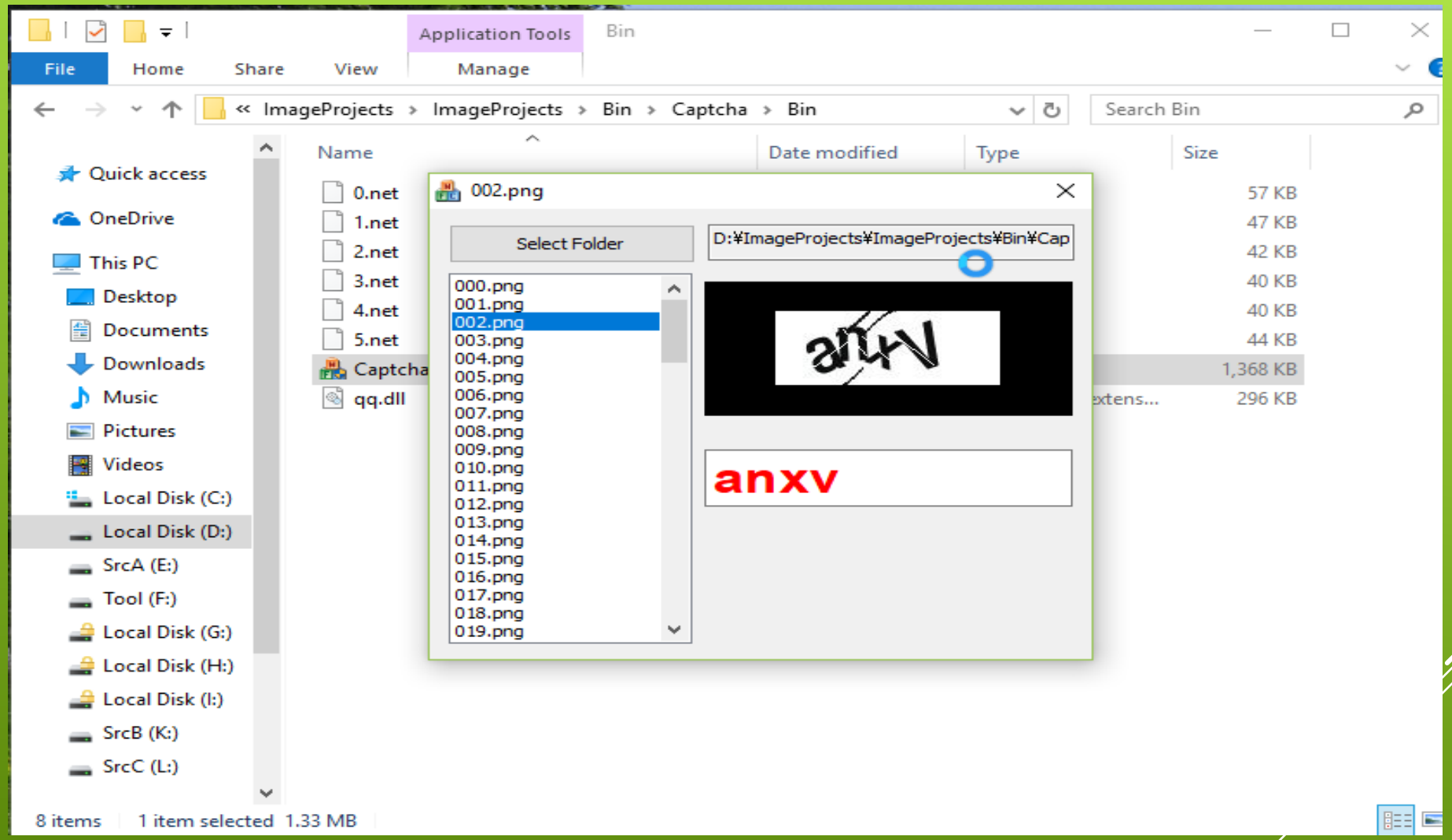
  Based on 6 characteristics of the image, this program forms 4 layers of neural network to recognize character.

  This program recognizes the characters in QQ messenger of Tencent Company.

- Instruction (Video Content 2.captcha.avi)

  Select folder and the image that needs to be recognized and click the name of the image in the list with mouse or the direction button keyboard.

  100 tested images are inserted additionally.


Application Tools
Bin
File
Home
Share
View
Manage
« ImageProjects › ImageProjects › Bin › Captcha › Bin
Search Bin
Quick access
OneDrive
This PC
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
Local Disk (D:)
SrcA (E:)
Tool (F:)
Local Disk (G:)
Local Disk (H:)
Local Disk (I:)
SrcB (K:)
SrcC (L:)
Name
Date modified
Type
Size
0.net
1.net
2.net
3.net
4.net
5.net
Captcha
qq.dll
57 KB
47 KB
42 KB
40 KB
40 KB
44 KB
1,368 KB
296 KB
8 items
1 item selected 1.33 MB
002.png
Select Folder
D:¥ImageProjects¥ImageProjects¥Bin¥Cap
000.png
001.png
002.png
003.png
004.png
005.png
006.png
007.png
008.png
009.png
010.png
011.png
012.png
013.png
014.png
015.png
016.png
017.png
018.png
019.png
anxv

2.3 FACE RECOGNITION (VIDEO PLAYER CAPTURE MODE) (FR)

- Operation environment

  It works in any system and environment.

- Technical Details

  It’s a system that differentiates people with face recognition technology.

  This program recognizes relevant targeted faces and consists of programs such as server, control and terminal to manage them entirely.

- Instruction (Video Content 3.FR.avi)

  Open the program and click the start button, select the search tab to detect the face (place the video player screen at the top) . Information and photos of 30 registered faces are inserted for testing.

2.4 FIRE DETECT PROGRAM

- Operation environment

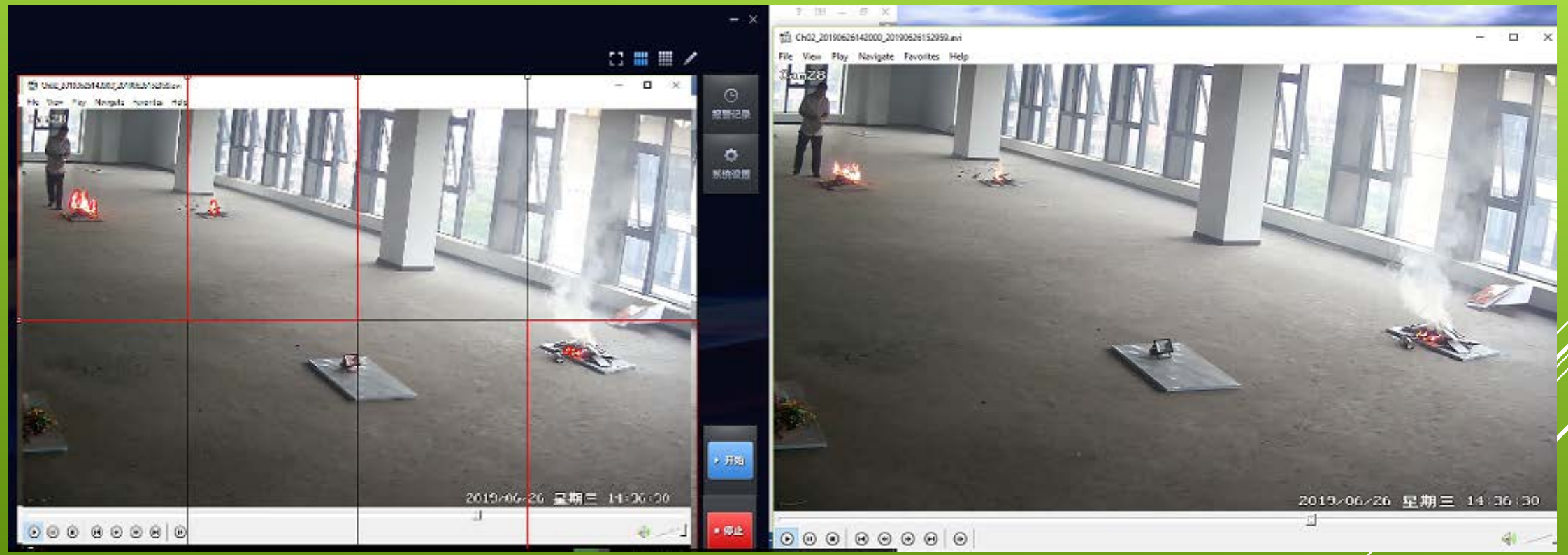
  It works in any system and environment.

- Technical details

  It detects fire through the modeling of fire flicking motion features.

- Instruction (Video Content 4.Fire.avi)

  Click the start button and select the video, place the video player window at the top to automatically detect the fire by capturing the video.


报警记录
系统设置
开始
停止
2019/06/26 星期三 14:36:30
File View Play Navigate Favorites Help
2019/06/26 星期三 14:36:30

2.5 SMOKE DETECT PROGRAM

- Operation environment

  It works in any system.

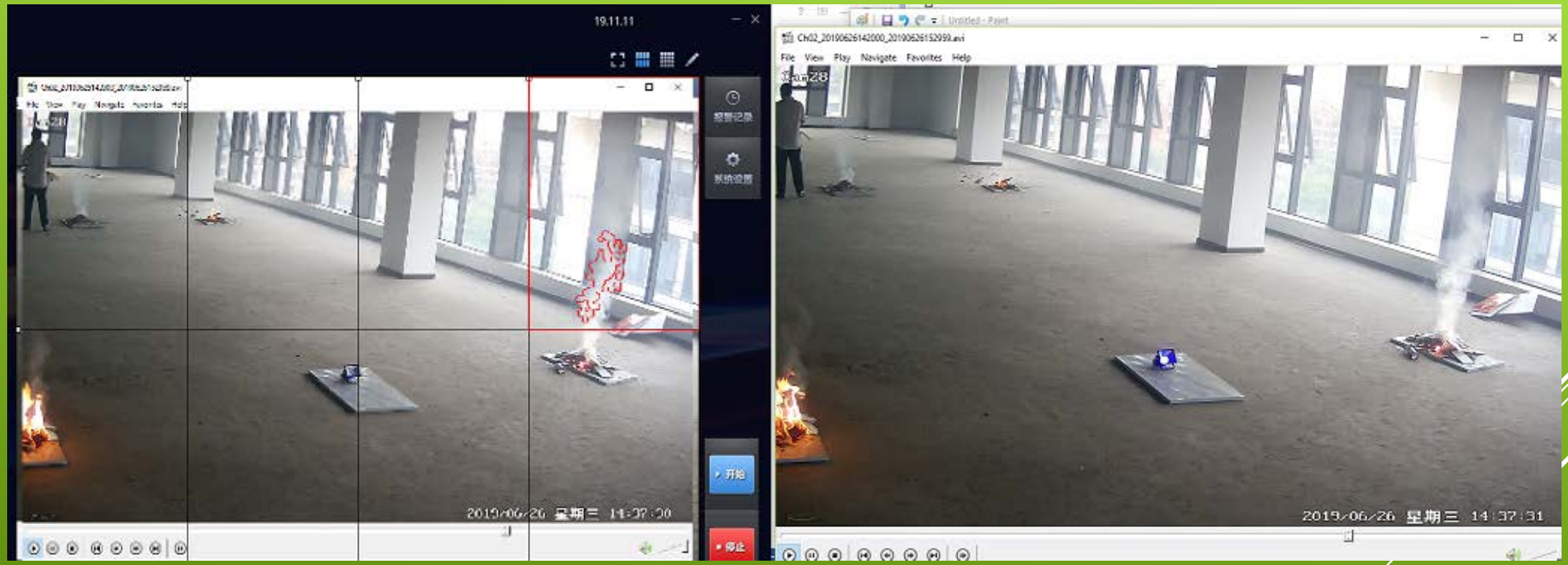
- Technical details

  It detects smoke through the modeling of smoke flicking features.

  Although smoke and fire flicking motion features look the same normally, in modeling, there are differences. Thus, fire and smoke detection is carried out with the different modeling result.

- Instruction (Video Content 5.Smoke.avi)

  It is a program to detect smoke. Click the start button and select the video, place the video player at the top to automatically detect the smoke by capturing the video.


19.11.11
报警记录
系统设置
开始
停止
2019/06/26 星期三 14:37:30
Ch02_20190626142000_20190626152959.avi
File View Play Navigate Favorites Help
2019/06/26 星期三 14:37:31

2.6 LICENSE PLATE RECOGNITION (LPR)

- Operation environment

  It works in any system.

- Technical details

  It crops the number plate domain from the car photo and separate characters from the plate and recognize those characters with neural network.

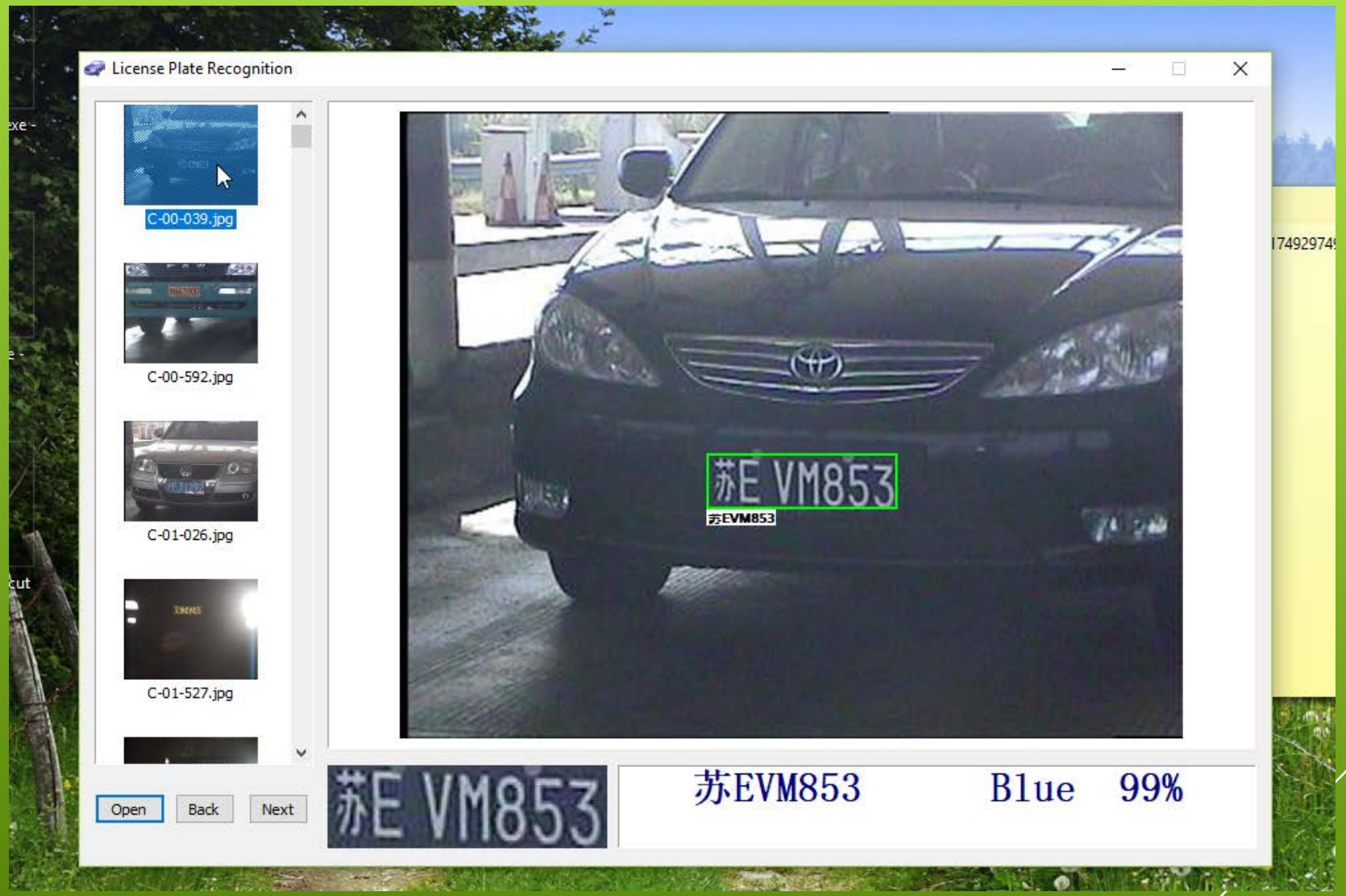
  It can recognize number plate of Chinese, English and Korean.

  Captcha technology is applied in recognizing the separated characters of the number plate.

- Instructions (Video Content 6.LPR.avi)

  Start the program, click the open button and select the number plate image to place them in the list. Check the recognition result by scrolling the mouse up and down or with the direction button of the keyboard.

  150 tested photos are inserted additionally.


License Plate Recognition
C-00-039.jpg
C-00-592.jpg
C-01-026.jpg
C-01-527.jpg
苏E VM853
苏EVM853
Open
Back
Next
苏E VM853
苏EVM853 Blue 99%

2.7 FACE RECOGNITION PROGRAM (IMAGE MODE)

- Operation environment

  It works in any system.

- Technical details

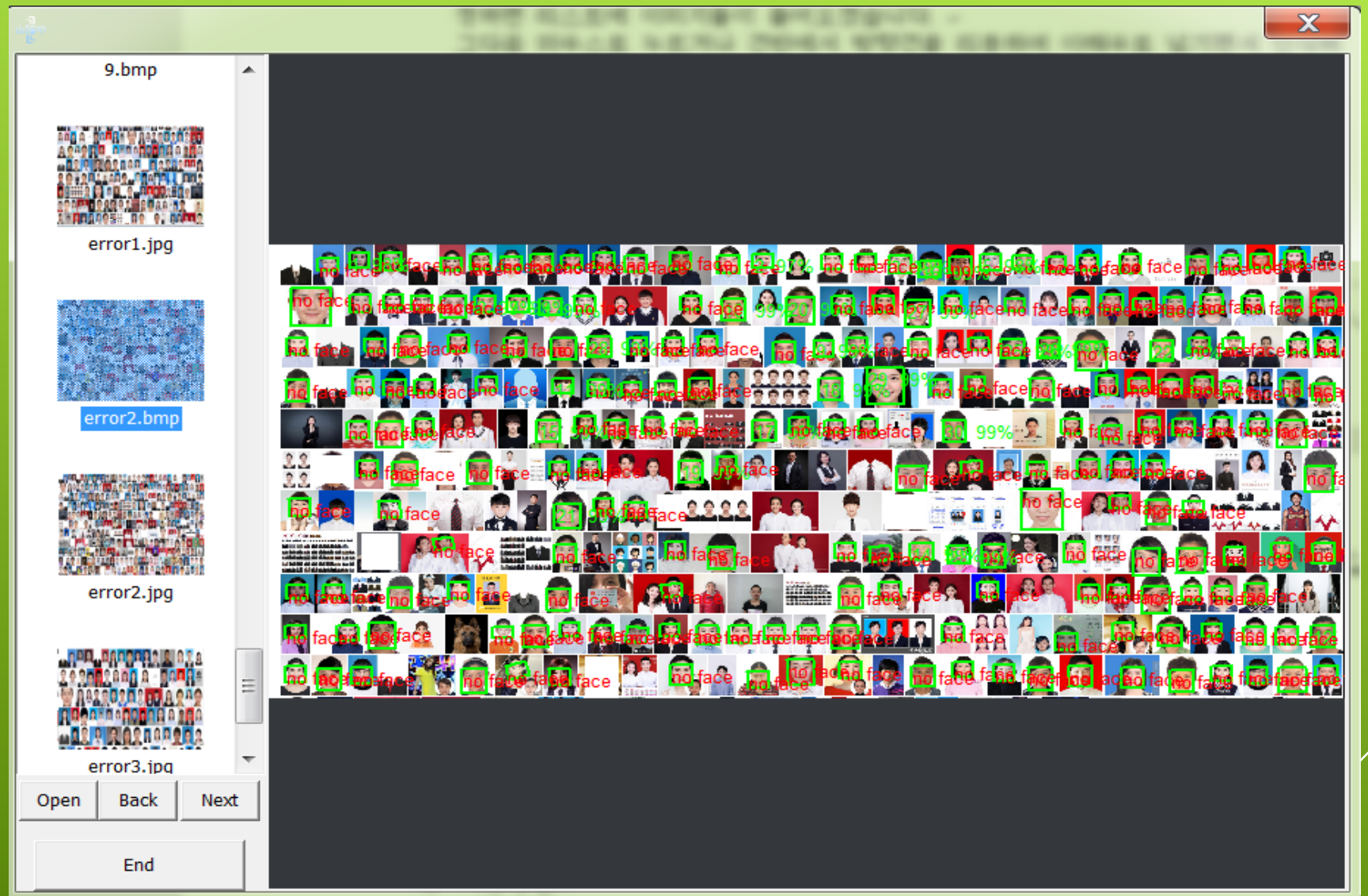
  It is a program that differentiates people with face recognition technology.

  The above mentioned FR program recognizes faces in videos whereas this program recognizes faces in photos.

  It shows how registered photos of 30 people are found in the photo in which 200 photos of people including the registered targets are displayed.

- Instruction (Video Content 7.FR(Image).avi)

  Click the open button and select the photo folder, then the lists are displayed like the image above shown. Select the relevant photo in the list to perform recognition.


9.bmp
error1.jpg
error2.bmp
error2.jpg
error3.jpg
Open
Back
Next
End

2.8 EYE MONITOR PROGRAM

- Operation environment

  It works in any system.

- Technical details

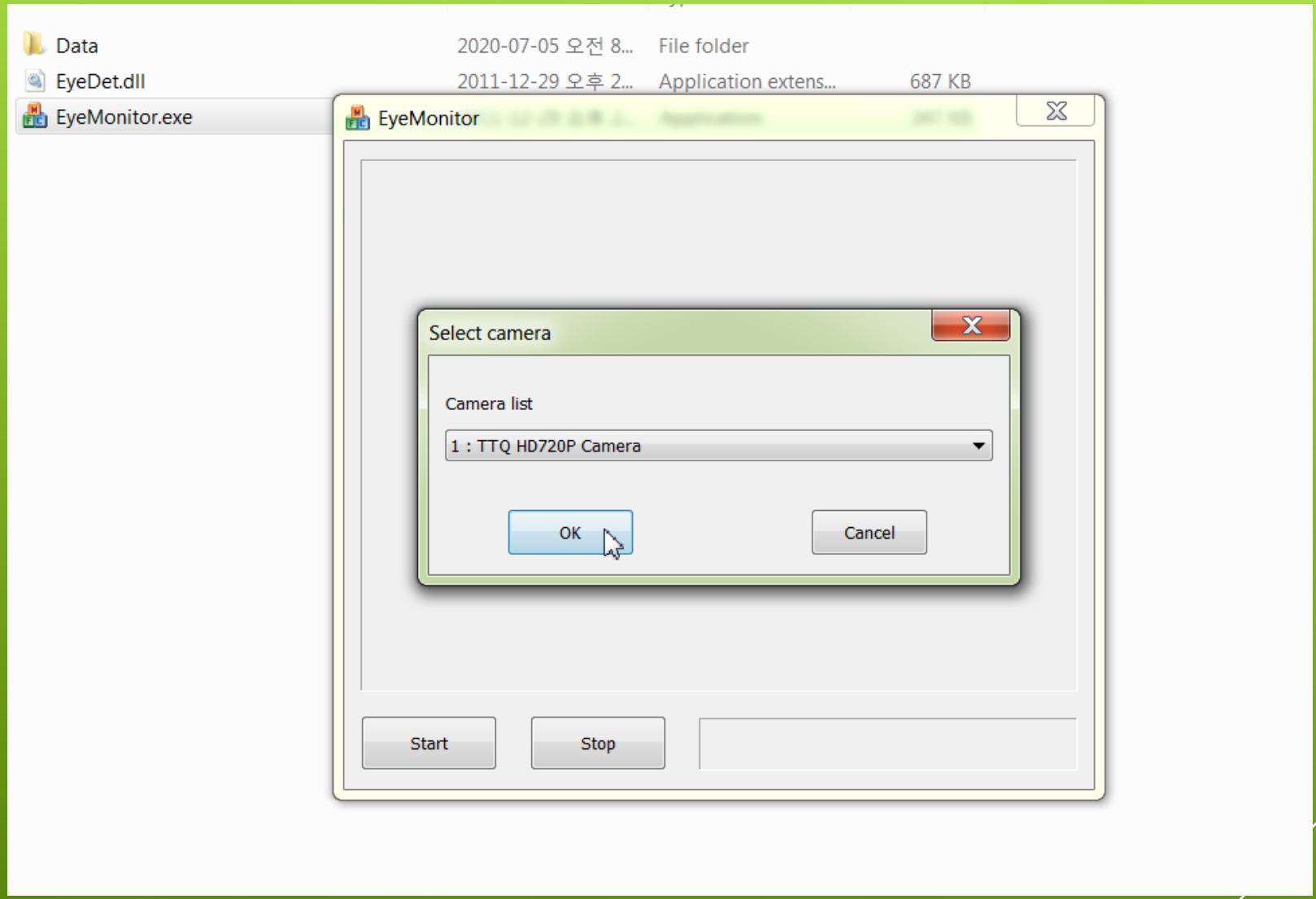
  After finding the face domain, it estimates the location of the eye.

  And through neural network, it decides whether the eyes is closed or opened.

  It carries out a study on whether the eye is closed or opened, and compose study system. And based on this study system, it decides whether the eye is closed or opened. This program is used to detect sleepiness, in educational places to find sleeping students or in other fields that is related to human eyes.

- Instructions(Video Content 8.EyeMonitor.avi)

  Open the program and click the start button then select the camera and click OK button like the picture shown above. It detects the eye domain, monitor and alert whether the eye is closed or opened. Closed eye results red square and opened eye shows green square. When the eye is closed , the word “alarm” is shown in red.


Data
2020-07-05 오전 8...
File folder
EyeDet.dll
2011-12-29 오후 2...
Application extens...
687 KB
EyeMonitor.exe
EyeMonitor
Select camera
Camera list
1 : TTQ HD720P Camera
OK
Cancel
Start
Stop

2.9 FACE RECOGNITION PROGRAM(CAMERA MODE)

- Operation environment

  It works in any system.

- Technical details

  It differentiates people with face recognition technology. The previous mentioned face recognition program monitors the videos shown in video player (video players and camera control programs such as CMS) to detect the face whereas this current program receives video frames directly from camera and executes the recognition.

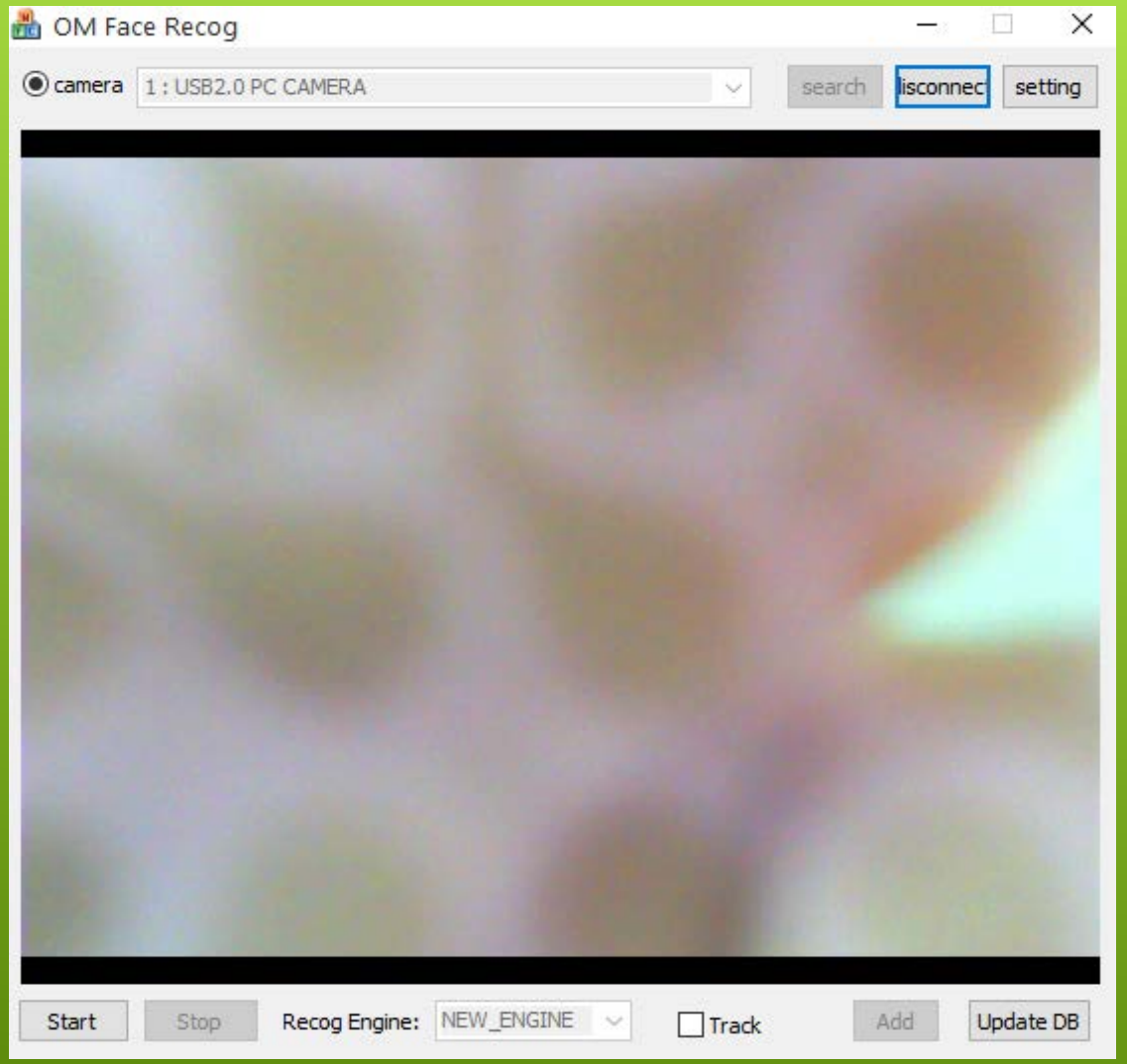
- Instruction (Video Content 9. FaceRecog.avi)

  Search the camera by clicking the search button and click connect button when camera is found. The engine starts once the start button is clicked.

  When green square shape, characteristic points and value are shown on the face, this shows that the face is recognized. People are identified according to the name displayed on the left side of the green square.

  In the case of registering the first time, click the Add button when green square is shown on the face and type in the name. Names can be inserted repeatedly.

  (Same name can be typed in to insert for the same person in different angle. If the face is named as Kim, the next time when face is registered can also be named Kim). Even in the case of one person, if it is registered several times according to different angle, the detecting ability becomes higher. After registering, press the update button.


OM Face Recog
camera
1 : USB2.0 PC CAMERA
search
lisconnec
setting
Start
Stop
Recog Engine:
NEW_ENGINE
Track
Add
Update DB

2.10 ABNORMAL MOTION DETECTION PROGRAM

- Operation environment

  It works in any system.

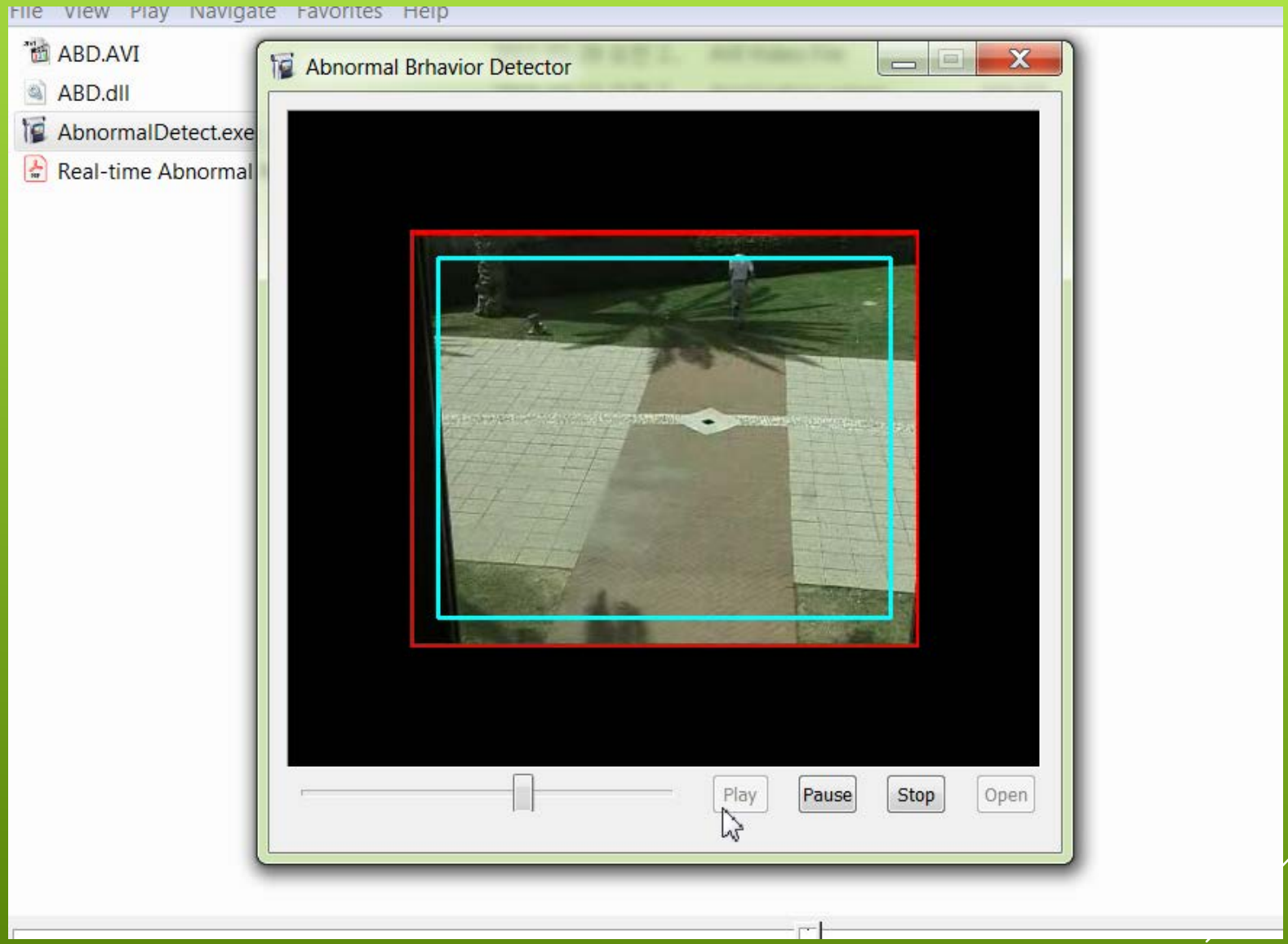
- Technical details

  It decides and reports abnormal motions by monitoring objects especially people that bump into each other or make abnormal actions. This video shows how the program detects abnormal motions. The place of red square shows the abnormal motion and this program instantly detects that motion accurately. There are many types of abnormal motions but the scale of the abnormal motion differs according to the motive.

  Detection settings can be customized based on the user's request.

- Instruction (Video Content 10.Abnormal Motion Detection.avi)

  Click open button, select ABD.AVI in the same folder and click play button to automatically start.


File View Play Navigate Favorites Help
ABD.AVI
ABD.dll
AbnormalDetect.exe
Real-time Abnormal
Abnormal Brhavior Detector
Play
Pause
Stop
Open

2.11 RESPIRATION RATE MEASUREMENT

- Operation environment

  It works in any system.

- Technical details

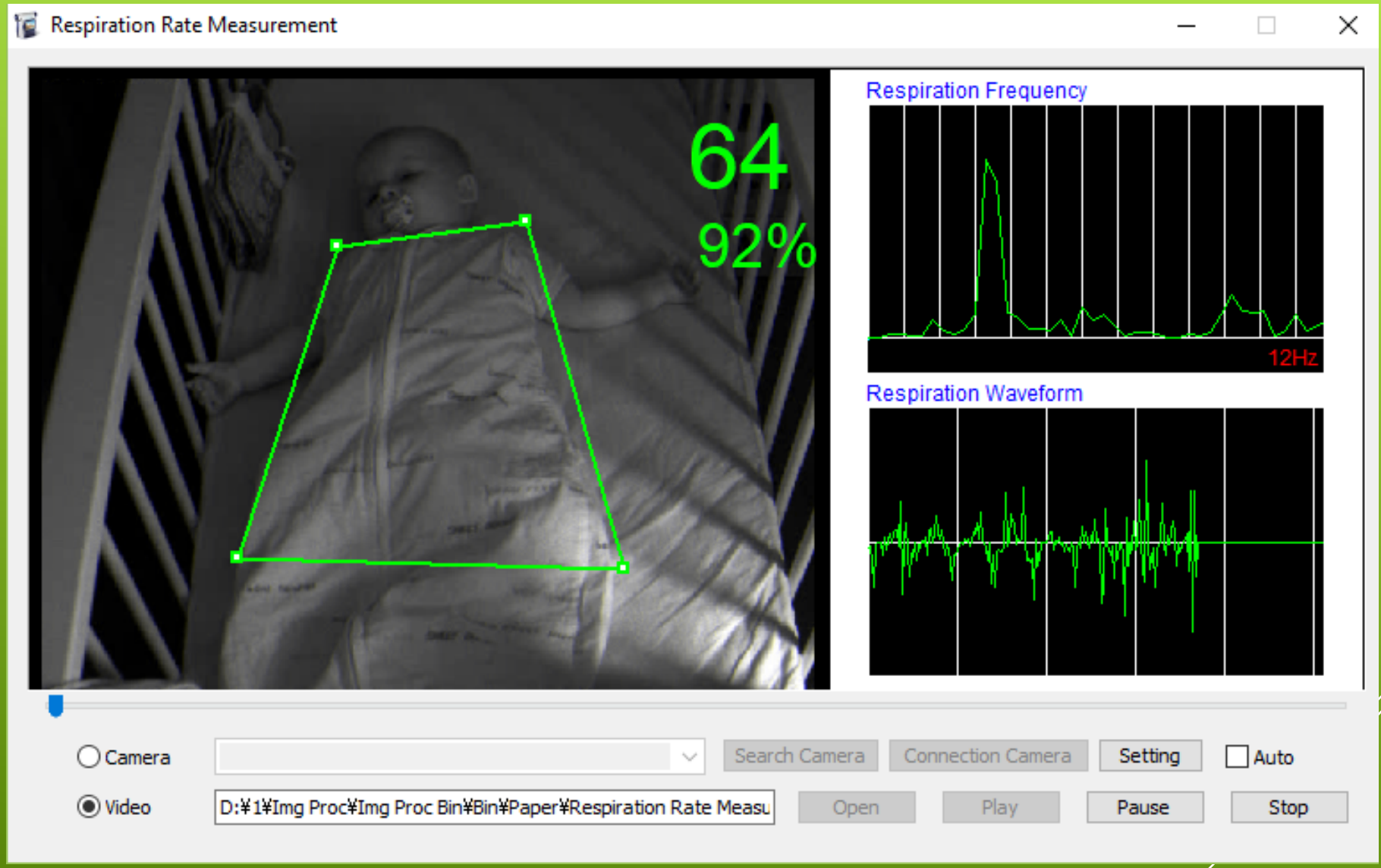
  The shake in the heart area and body is converted into frequency and according to medical studies, this frequency consists information related to heart rate. This program monitors the frequency and detects the heart rate.

  Like the picture above, person's respiration rate is detected when the heart area is selected.

- Instruction (Video Content 11.Respiration Rate Measurement.avi)

  In video mode, baby's respiration rate is automatically measured by choosing the video after clicking the open button and selecting the relevant location of the body and clicking the play button.

  In camera mode, respiration rate is automatically measured by selecting the heart domain of the body displayed in the image.


Respiration Rate Measurement
64
92%
Respiration Frequency
12Hz
Respiration Waveform
Camera
Search Camera
Connection Camera
Setting
Auto
Video
D:¥1¥Img Proc¥Img Proc Bin¥Bin¥Paper¥Respiration Rate Measu
Open
Play
Pause
Stop

2.12 HEART COUNT PROGRAM

- Operation environment

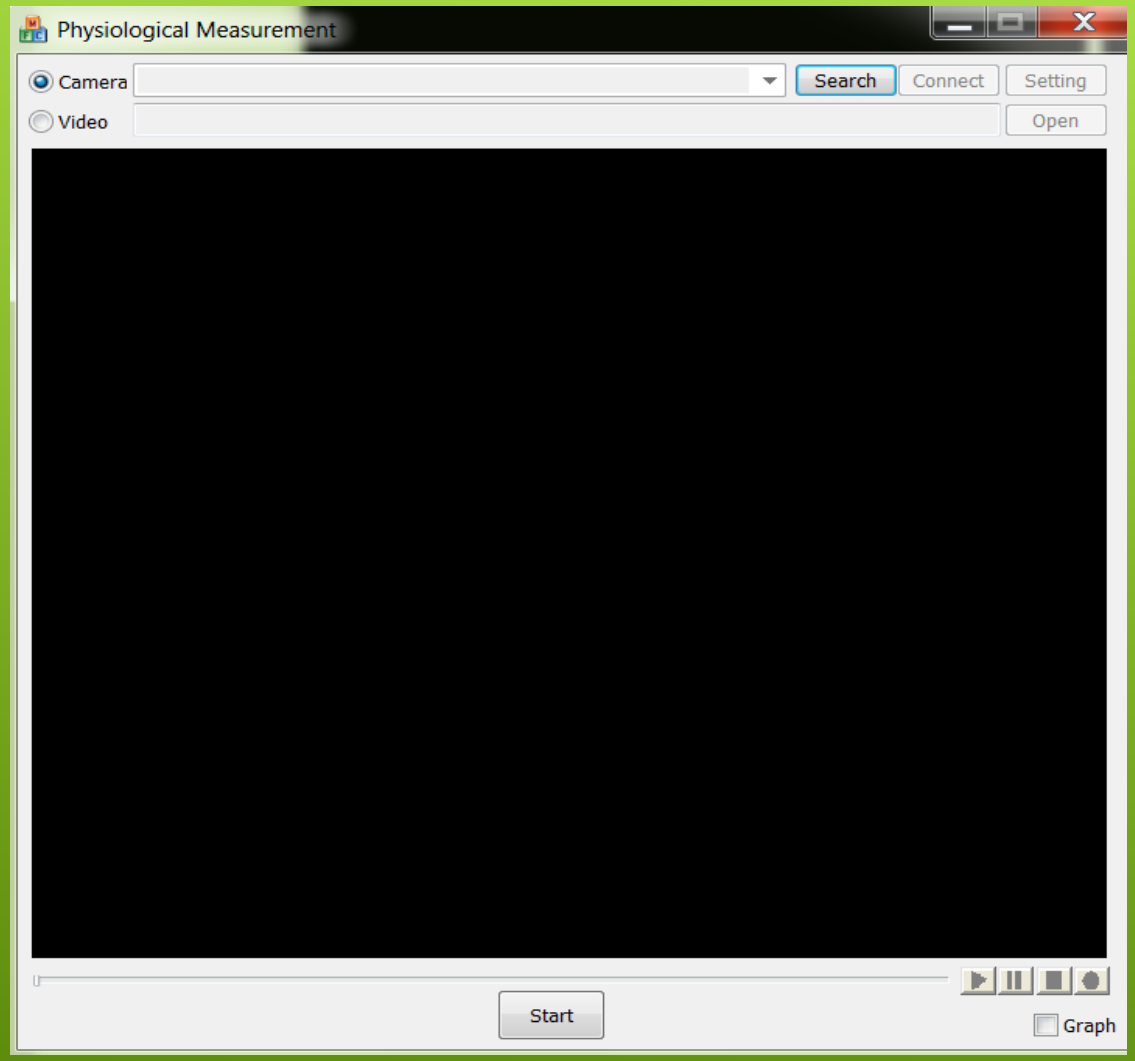
  It works in any system.

- Technical details

  Based on medical studies that explains respiration rate can be derived from color tone and shaking of the face, this program measures respiration rate with face related data.

- Instruction (Video Content 12.Heart Count.avi)

  After connecting the camera, press the start button and place the face in front of the camera to measure the heart rate. Make sure not to move the face until the result comes out. Result may not come out once face is moved.


Physiological Measurement
Camera
Search
Connect
Setting
Video
Open
Start
Graph

2.13 LED COUNT PROGRAM

- Operation environment

  It works in any system.

- Technical details

  It crops number domain from the Led domain and recognize numbers by using the neural network like the picture shown below. It is used to obtain relevant numbers in various types of Led.

- Instruction (Video Content 13.LedCounter.avi)

  Click the setting button and select the path of the relevant video. And choose the type to select which domain to detect. The video starts when the button on the right side of the picture is selected.


LED Counter
Channel 1
Setting
Type4
7.0
Channel 2
Setting
Type1
Channel 3
Setting
Type1
Channel 4
Setting
Type1

2.14 PHONE DETECTION PROGRAM

- Operation environment

  It works in any system.

- Technical details
  It decides the variation data of the object location and from that, it estimates how many times, how long and in which position the object was held.

- Instruction(Video Content 14.PhoneDetection.avi)

  Click the open button, select the relevant video and press the play button.

  Then automatically, it finds the phone and estimates how many time and how long the phone was held.


PhoneDetection:D:\New\ImagePro\ImagePro\...
Total
912
Current Frame:
216
InfoFlex Security Systems 2010-07-26 16:31:57
InfoFlex
2
0:0
0:5
0:0
0:0
0:0
0:0
07/27/2010 - 12:01:36
Open
Play
Pause
Stop
Exit

2.15 TMD PROGRAM

- Operation environment

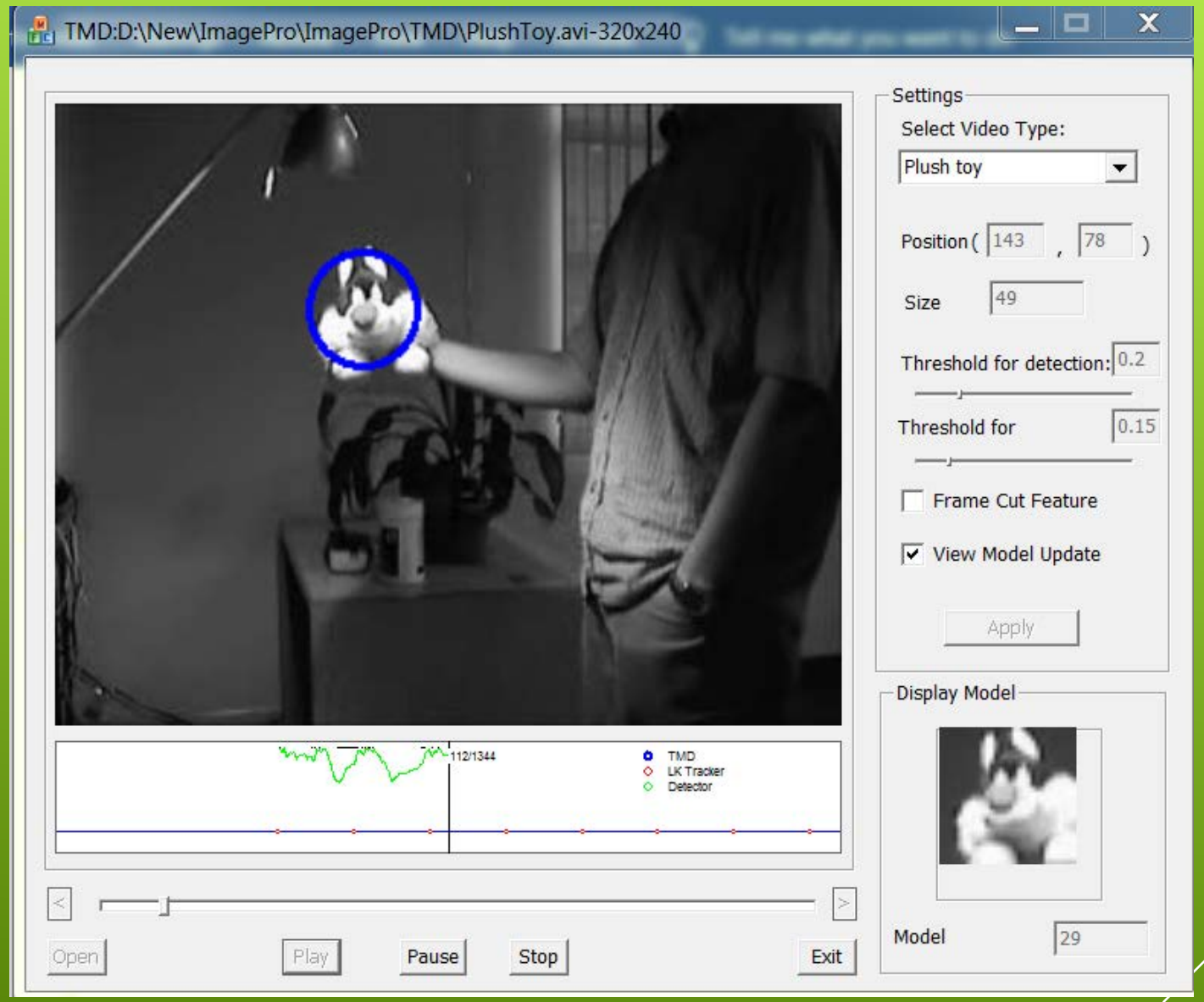
  It works in any system.

- Technical details

  When the assigned object makes a movement, this program tracks that object. In the case the object changes its shape or move in any other angle, it consistently studies the characteristics model and it compares with the assigned object and starts tracking. The video below shows the tracking of a toy. As you can see, the toy can be tracked despite the movements.

- Instruction (Video Content 15.TMD.avi)

  First click the open button to select the relevant video (Plush Toy.avi) and select Video. Choose Plush Toy in Type. Choose yes button when asked to confirm the selection and press Play to track the toy. The display model is shown at the right bottom of the screen.


TMD:D:\New\ImagePro\ImagePro\TMD\PlushToy.avi-320x240
Settings
Select Video Type:
Plush toy
Position (143 , 78)
Size 49
Threshold for detection: 0.2
Threshold for 0.15
Frame Cut Feature
View Model Update
Apply
Display Model
112/1344
TMD
LK Tracker
Detector
Model 29
Open
Play
Pause
Stop
Exit

2.16 PEOPLE COUNTING (FRONT)

- Operation environment

  It works in any system.

- Technical details

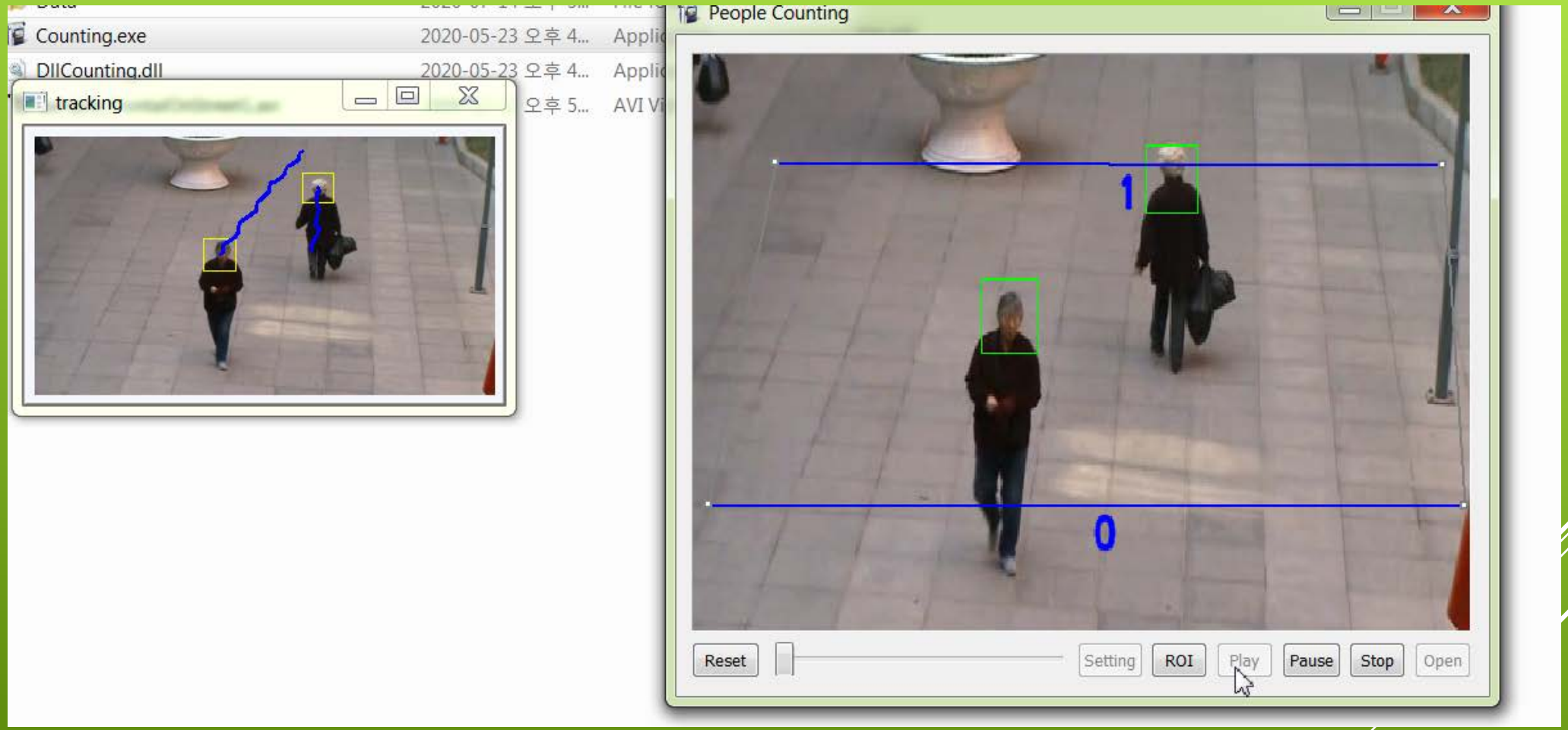
  It counts the number of people that passed by the relevant domain. In this program, it has Side, Front and Top part of counting based on the computer angle. The method of counting differs according to people passing by front, top and bottom part of the camera.

  It recognizes people based on the study of human body outline and it saves tracks of passed body. It also tracks down any object that moves and passes by the camera.

  Vehicle counting and other counting and tracking cases are carried out especially in the cross-section roads.

- Instruction

  Click open button, choose the video (Sample_FrontalOnStreet1.avi) and select the domain that needs counting and press the play button. Another tacking window pops up to show the history data of people.


Counting.exe
2020-05-23 오후 4...
DllCounting.dll
2020-05-23 오후 4...
오후 5...
tracking
People Counting
1
0
Reset
Setting
ROI
Play
Pause
Stop
Open

2.17 PEOPLE COUNTING (SIDE)

- Operation environment

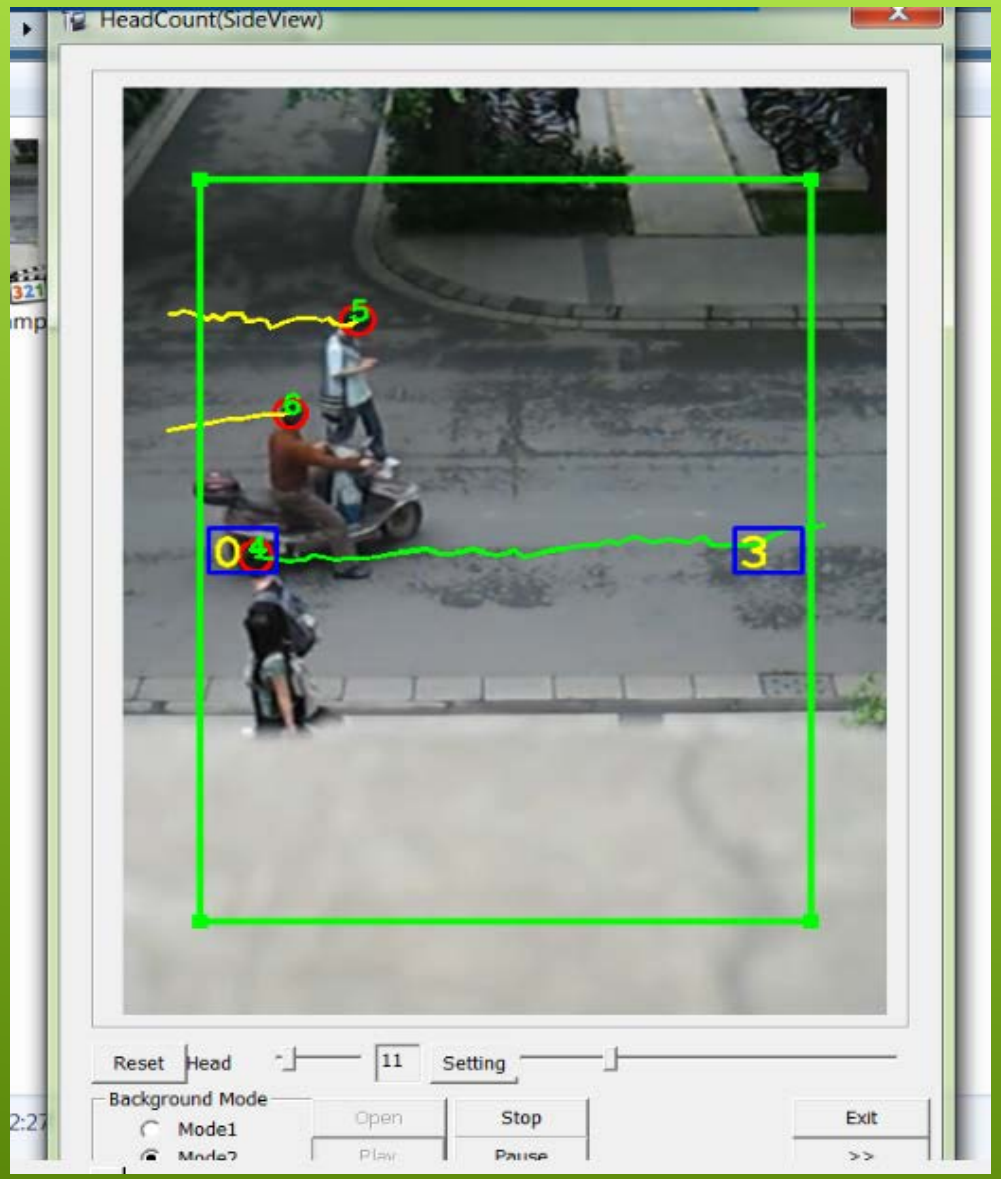
  It works in any system.

- Technical details

  It counts the number of people that passed by the relevant domain. In this program, it has Side, Front and Top part of counting based on the camera angle. The method of counting differs according to people passing by front, top and bottom part of the camera. It recognize people based on the study of human body outline and it saves tracks of passed body. It also tracks down any object that moves and pass by the camera. These are saved in the database and so the relevant data can be seen any time.

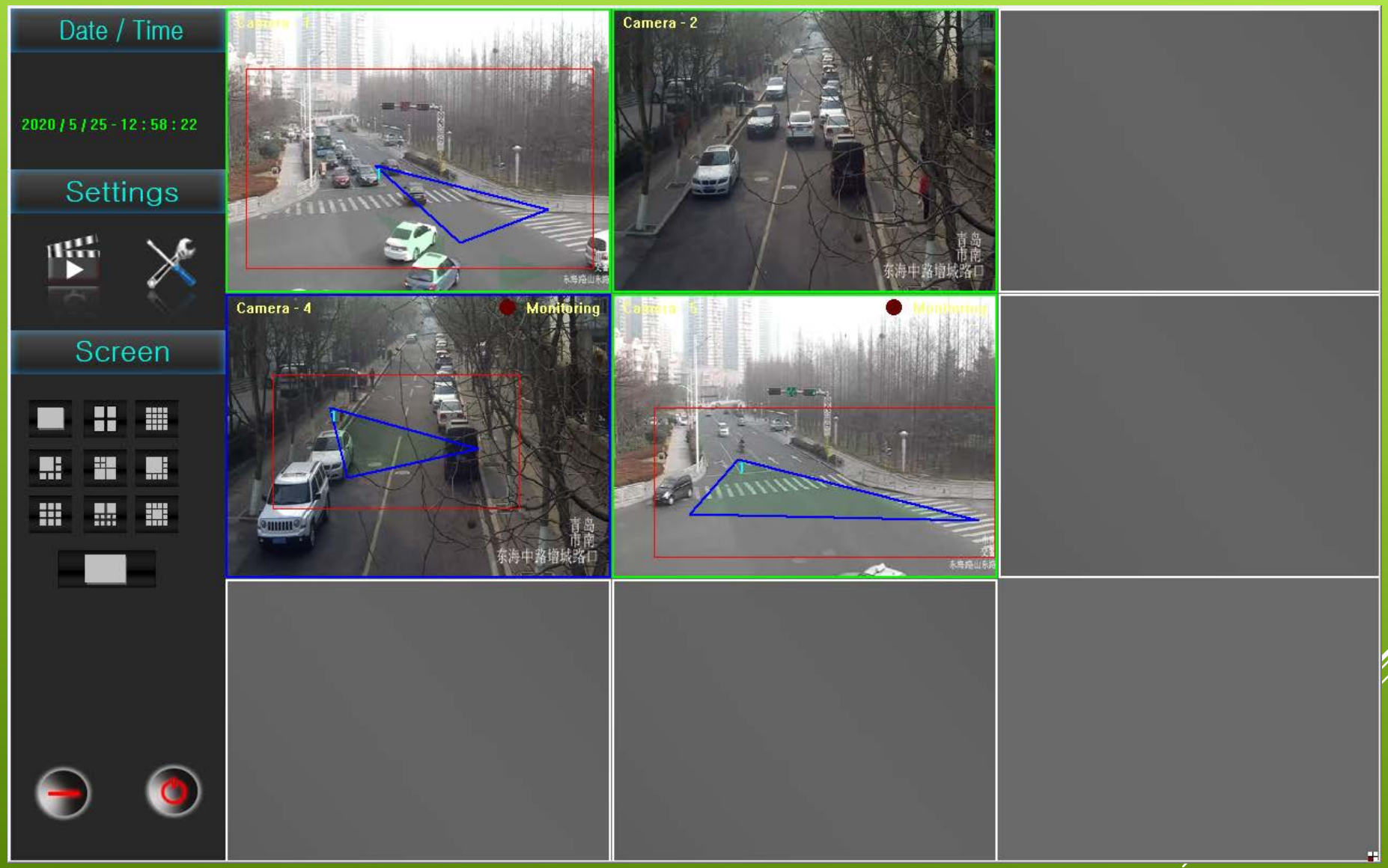
- Instruction

  First select Mode 2 and click open button to select relevant video (SideViewSample02.avi) and press Play button to start automatically. The collected data are saved in the database and you can check the saving statement at the bottom right corner (>>) of the screen.


HeadCount(SideView)
5
6
0
3
Reset
Head
11
Setting
Background Mode
Mode1
Open
Stop
Exit
Play
Pause
>>

2.18 AREA MONITORING CAMERA

- Area detecting program detects movement of vehicles and people derived from monitoring data of DVR, NVR and IP camera and sends alarm and keeps record of it. It can select various detection areas by drawing into polygon shape. This program is based on image processing technology and machine study technology that extracts moving objects by separating the fixed background of the monitoring area.


Date / Time
2020 / 5 / 25 - 12 : 58 : 22
Settings
Screen
Camera - 2
Camera - 4
Monitoring
青岛
市南
东海中路增城路口