# PDA Simulator User Manual: Face Detection on still image

## 1. Overview

Image interface add to PDA simulator with the functionality of detecting frontal faces on still image. You can select a image of JPG or BMP format and it will mark the faces areas on the image with a green rectangle. It also estimates the rotate angle of the frontal faces that detected. However the rotate angle is limited within [- 60,60] degree. Whenever the picture is displayed on the screen you can click the center to zoom it in.

Detecting faces on a large still image is very time-consuming. (Average detection time is about one second on my notebook, with Celeron III 1.2G 256M SDRAM inside, but on some old machine, it is bound to take much more time) So I create a separated working thread to do this instead of doing this in UI thread. Detecting faces is divided into two stages: **Preprocessing** and **Searching**. Preprocessing segments the original image according to a built-in skin model and then clusters the result of image segmentation into several candidate rectangles that contain skin color blocks. This stage spends about hundreds of milliseconds and then Searching stage. In Searching stage, relatively this stage is more time-consuming, it searches all 19X19 windows in the image-pyramid of every candidate rectangles. Searching Stage needs about several seconds, depend on the numbers of candidate rectangles and the size of them.

## 2. Screen layout and functions

The bottom of the screen displays working status and rest area is divided into three panels. The first one contains the original image and it will switch to the image of detection result after the Searching stage ends. The second one displays an binary image, in which write pixels represents skin color pixels. The last panel shows an image with candidate skin color blocks marked with green rectangles.

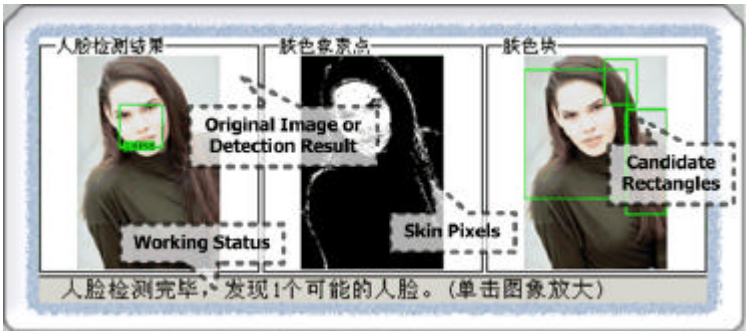



Figure 1. Screen layout

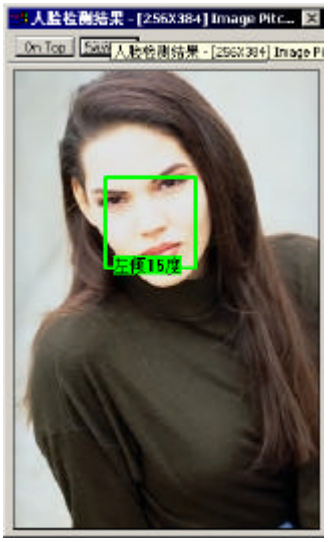


Figure 2. Zoomed window

Whenever there is an image in the panel, you can click the center of the image to zoom it in. It would popup a window like the one in figure 2. Click right mouse button to close it. (Of course, the X button also can do.) From this window you see the detailed result of face detection. One green rectangle marks one face. The rotate angle of the face is displayed on the bottom.

## 3. Keyboard functions

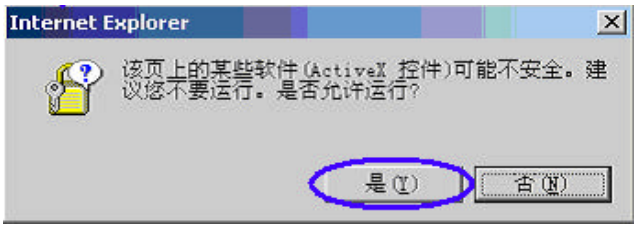
Any time, you can click  select an image for face detection. When detection is in progress, all buttons is disabled. After detection, you can click  again to select others images or click one of keys in the keyboard to return to the original state.

## 4. Runtime requirement

This software is partly based on IE (Microsoft Internet Explorer) and use HTML and ActiveX. You need not to manually register the ActiveX SimCore.Dll, it will be automatically registered when KeySim.exe startups. It runs on Win32 platform (includes Win98/Me Win2000/XP) but the following is required or it won't run correctly (at least damage its visual effects):

1. With IE 5.5 or newer version installed. (with IE 5.0 there is a small bug but you may not notice it ^_^)
2. With TureType font "**新宋体**" (simsun.ttc) installed. (Win2000 ready have it but Win98 don't :-( )

When you run this software, you may experienced security warnings reported by IE (depend on your own internet security settings and version of IE) like the following. Don't worry, just click "Yes", it is no hurt to your computer.




**In addition**, you must have GdiPlus.Dll in your system directory or in the same fold of the program. (Only Windows XP has it preloaded.) I recommend running this program on Win2000/XP platform otherwise the scaled images in the screen of PDA would be very rough. (lucky, this do not effect the zoomed window)