

Real time pose recognition based on skin detection algorithms



CONTENT

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INTRODUCTION TO OPEN CV

- It is a library of programming functions mainly aimed at real time computer vision, developed by Intel and now supported by Willow Garage.
 - 2D and 3D feature toolkits
 - Egomotion estimation
 - Facial recognition system
 - Gesture recognition
 - Human-Computer Interface (HCI)
 - Mobile robotics
 - Motion understanding.
 - Object Identification.
 - Segmentation and Recognition
 - Stereopsis Stereo vision: depth perception from 2 cameras
 - Structure from motion (SFM)
 - Motion tracking
- The library was originally written in C and this C interface makes Open CV portable to some specific platforms.
- OpenCV's application areas include:

INTRODUCTION

VISION-BASED HAND GESTURE POSE

- Active area of research in human-computer interaction (HCI)
- Direct use of hands to communicate
- The trend in HCI is moving towards real-time hand gesture recognition and tracking for use in interacting with video games, remote-less control of television sets, and interacting with other similar environments



INTRODUCTION

SKIN-TONE DETECTION

- A cue for detection and tracking of faces and hands due to its invariance to orientation and size
- The first phase of the pre-processing engine involves separating potential hand pixels from non-hand pixels
- The skin-tone color detector implemented operates in the normalized RGB space
- The input RGB image is first converted into the HSV space
- In various environments where the lighting conditions are not optimal, these thresholds can be adjusted dynamically using an inductive approach to robustly extract skin pixels.



Blocks Scheme

Input images through a webcam (video)



Image processing: filtering and transformation from RGB to HSV and then to BW



Blob detection to skin detection.



Splitting of the image in 9 R.O.I. (region of interest) and find where the blob is.



Programm

```
c:\Documents and Settings\TRABHD13\My documents\Visual Studio 2008\Projects\PoseRe...
X: 166 - Y: 186
no blobs: 1

X: 166 - Y: 186
no blobs: 1

This is position: 1

X: 166 - Y: 187
no blobs: 1

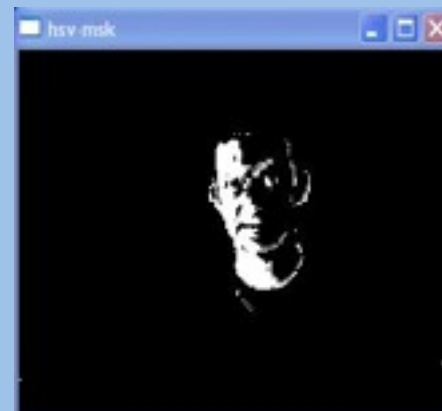
X: 166 - Y: 187
no blobs: 1

This is position: 1

X: 172 - Y: 188
no blobs: 1

X: 172 - Y: 188
no blobs: 1

This is position: 1
```



Programm

```
c:\Documents and Settings\TRABH013\My documents\Visual Studio 2008\Projects\PoseRe...
X: 86 - Y: 182
X: 288 - Y: 117
X: 171 - Y: 131
no blobs: 3

X: 86 - Y: 182
X: 288 - Y: 117
X: 171 - Y: 131
no blobs: 3

This is position: 4

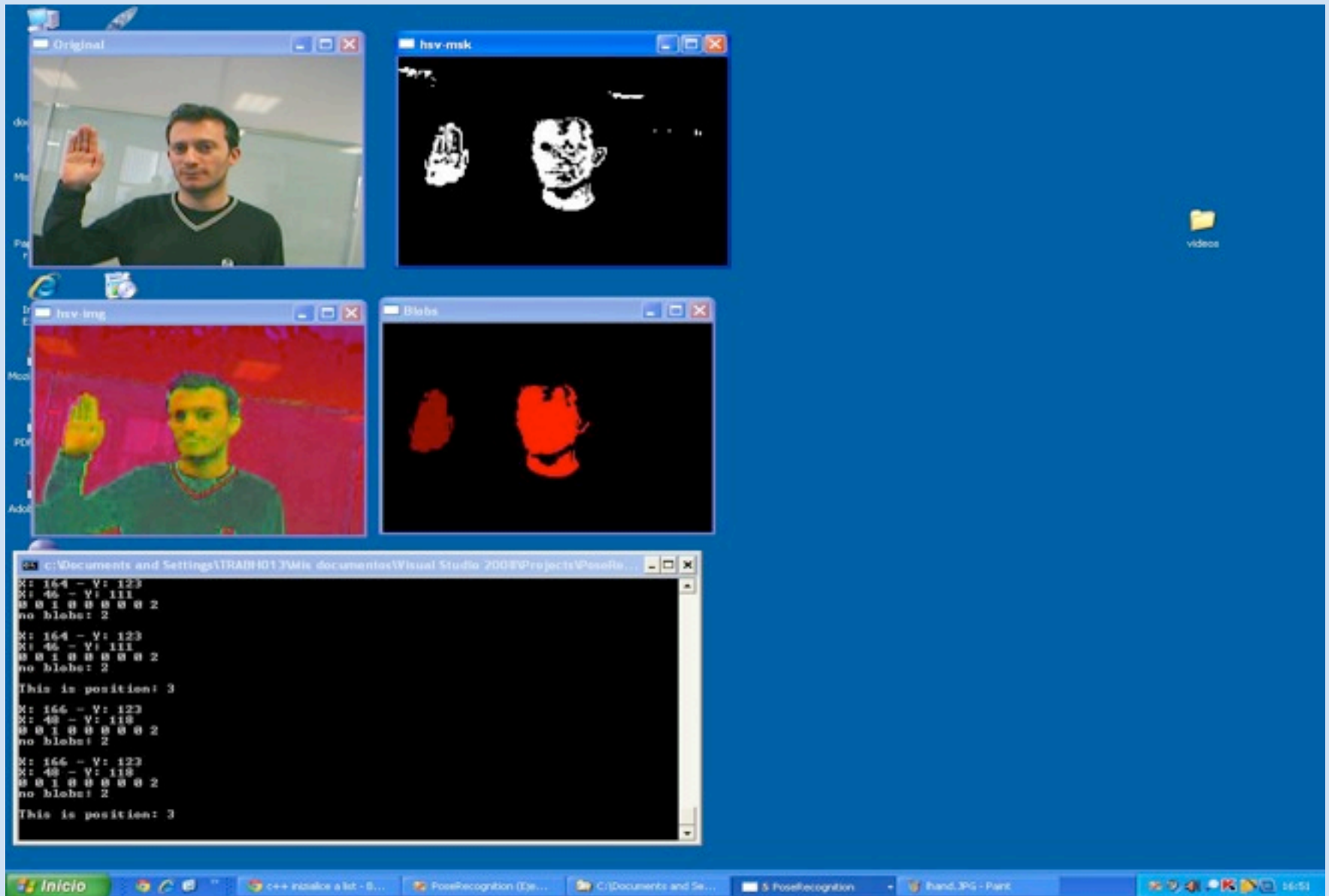
X: 86 - Y: 181
X: 278 - Y: 117
X: 169 - Y: 131
no blobs: 3

X: 86 - Y: 181
X: 278 - Y: 117
X: 169 - Y: 131
no blobs: 3

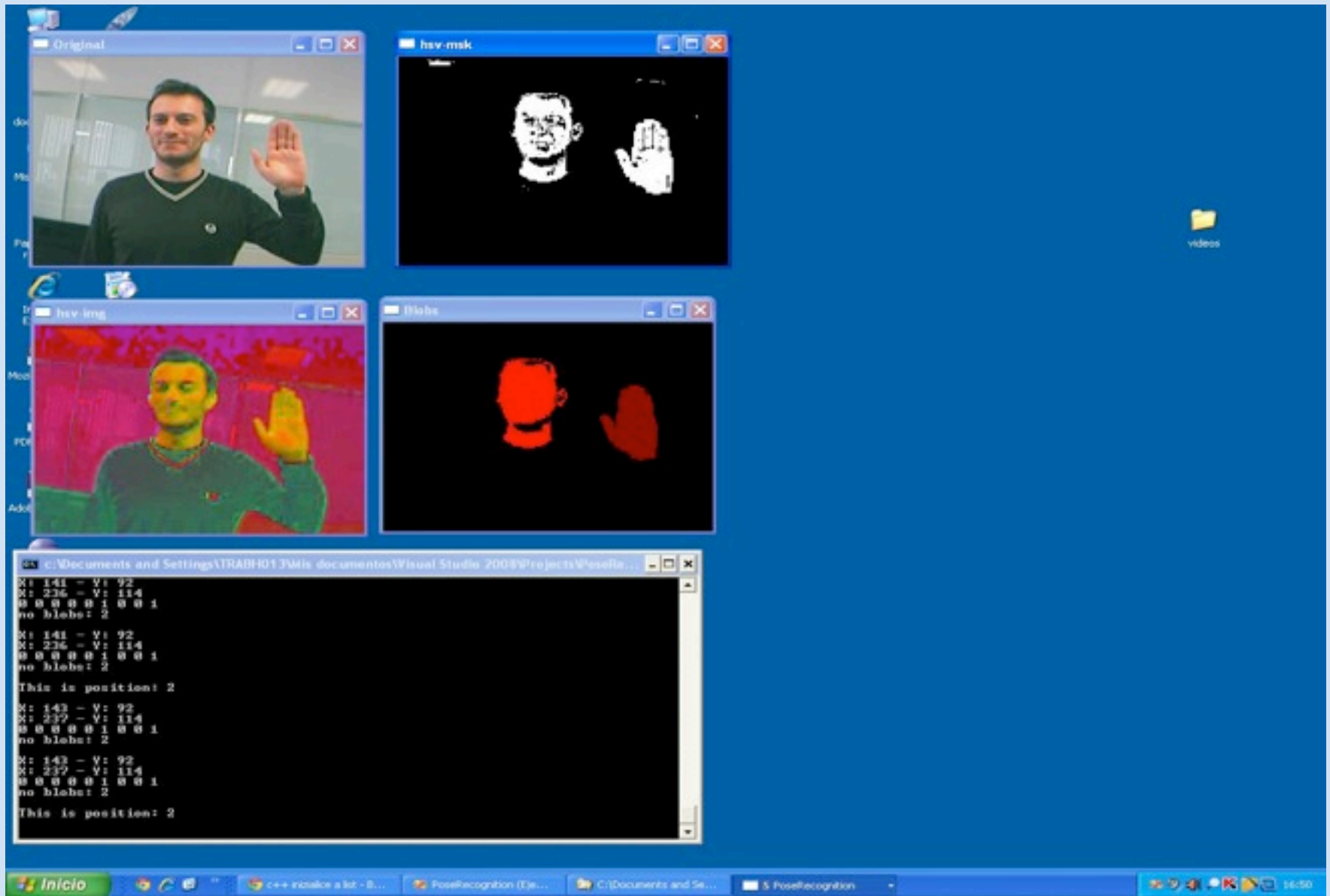
This is position: 4
```



Programa



Programa



Conclusions

- Hand detection could be used for many cases of limited mobility of a person.

The subject is involved into the scene, can reach regions of interest and interact with them to drive intelligent environments in a house, or, simply to control and click a mouse pointer into a screen.

ADVANTAGES :

- * Very easy way for make people with spastic diseased using a laptop or interact with virtual social networks such as second life.

DISADVANTAGES :

- * Not allowed for people who has thetraplegia or several spastic diseases belong to upper limbs.