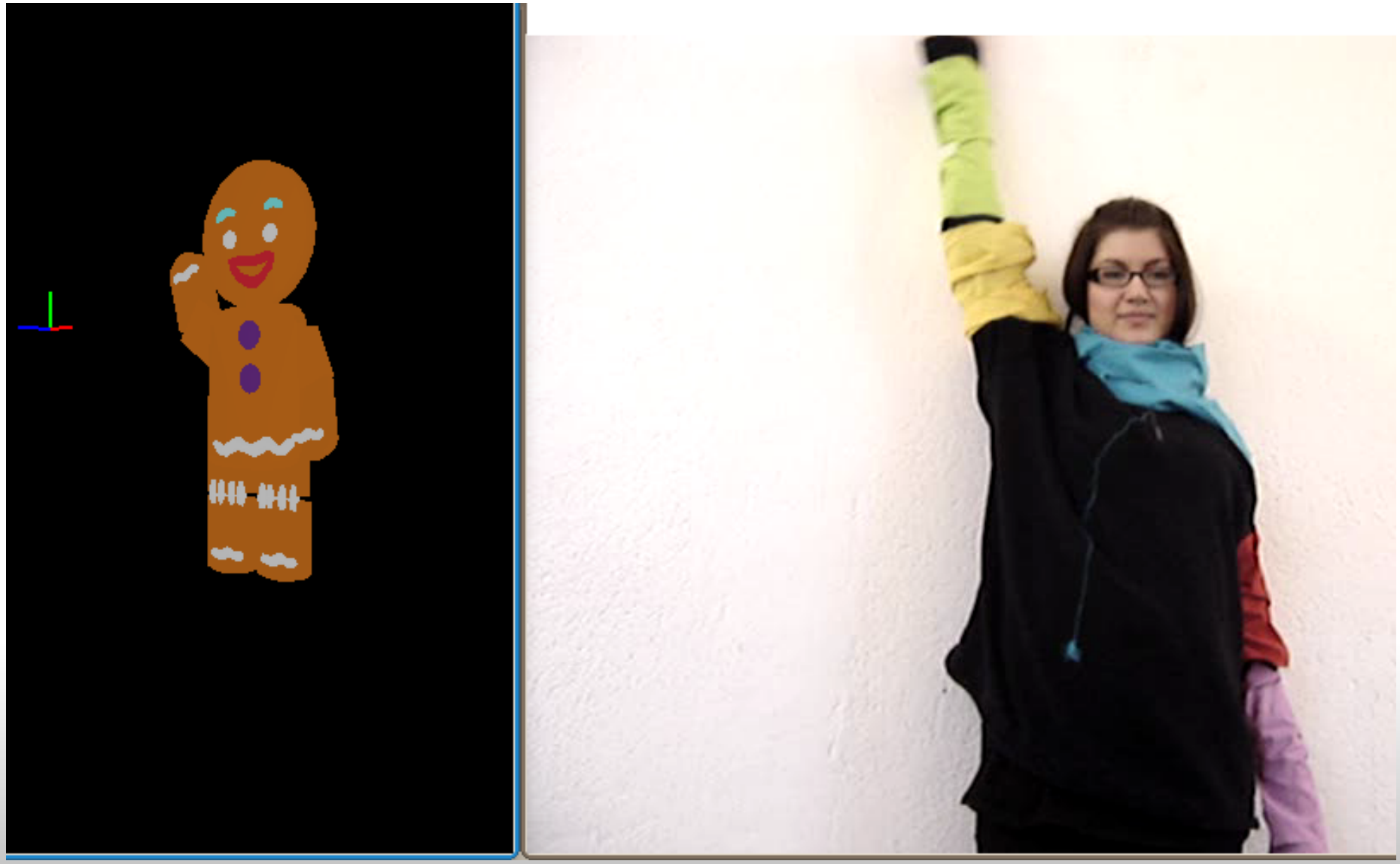
AGI09 -Project - EasyMocap



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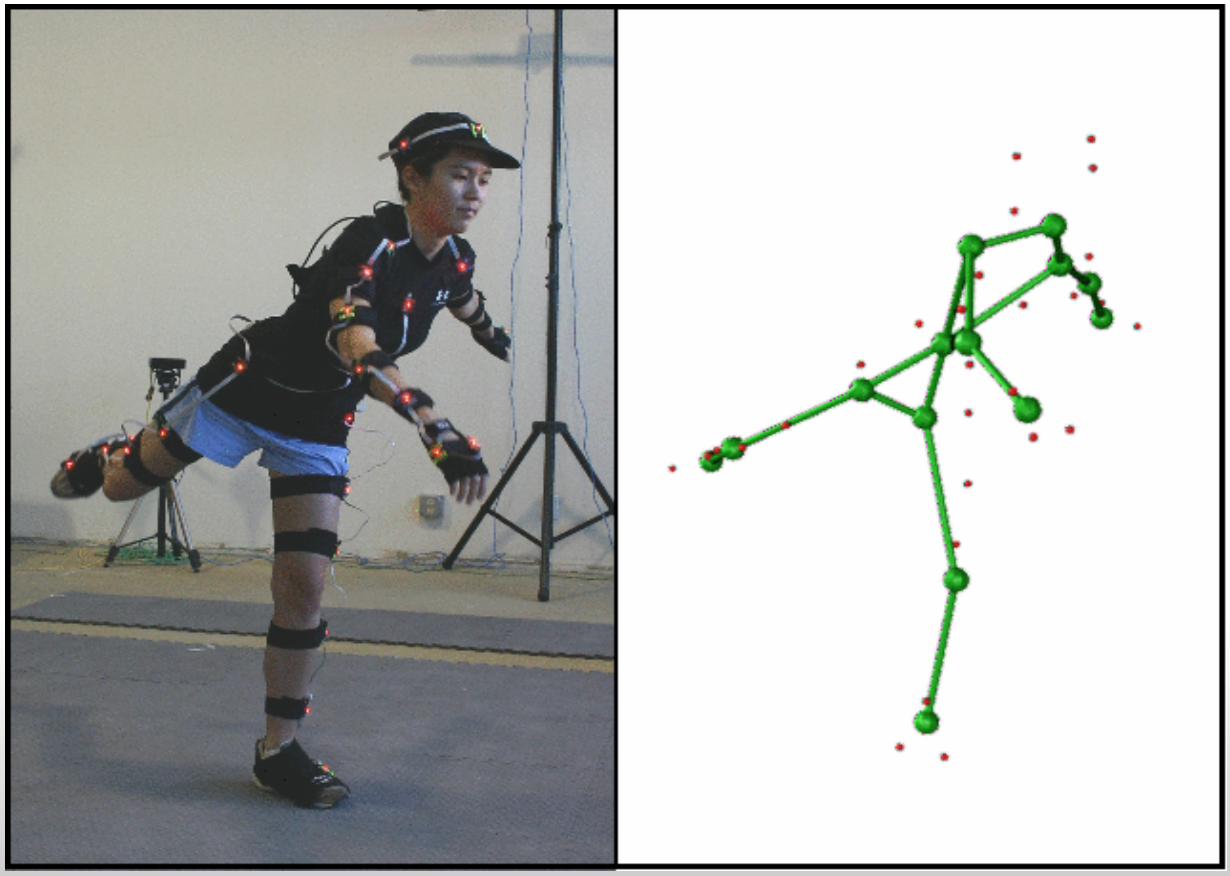
Introduction

- Motion Capture



- Easy Mocap
- Maya 3D model in OpenGL; Gingy
- 5 different colormarkers; yellow, blue, red, green,pink
- C++ programming

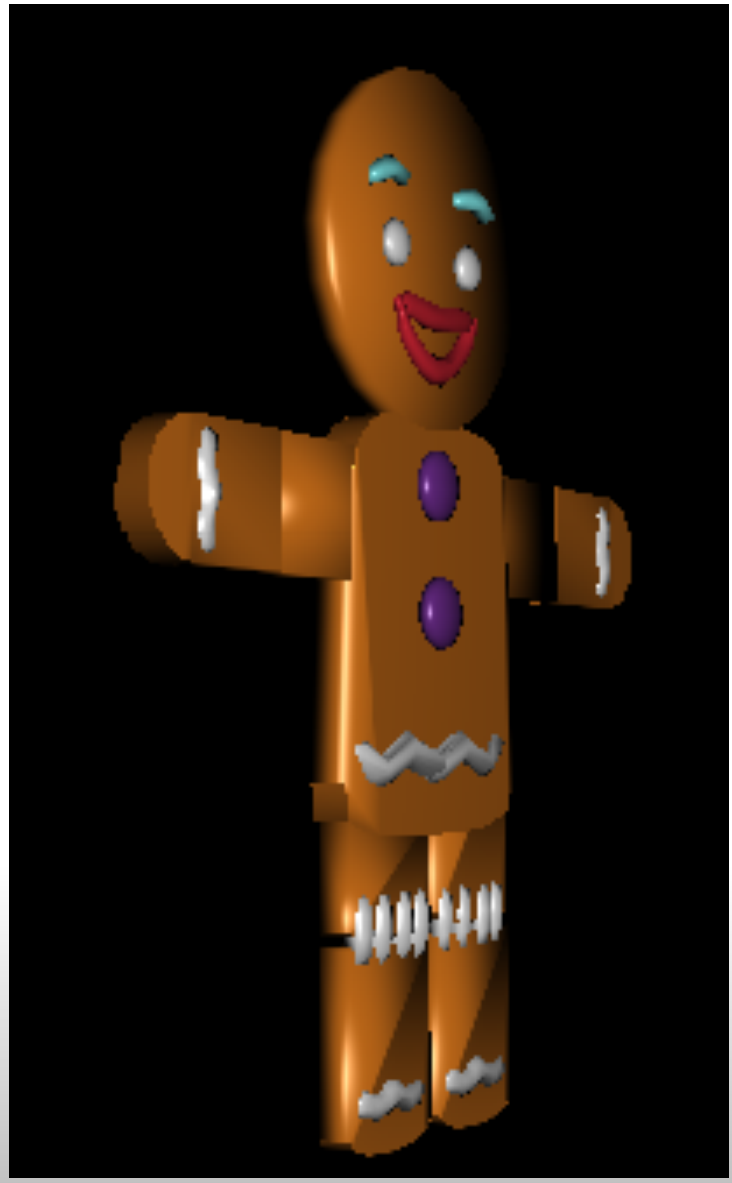
1. General structure of the program

Image analysis :
Input : recorded video
Output : orientation of every zone of pixels with a certain color

Human body :
find the orientation of the actor according to markers

Representation of the body :
send the data to the OpenGL figure

1.1 The Maya model



- Model: Gingy from Shrek
- Bodystructure as a human
- Modelled in 10 parts: thines, shins, forearms, upperarms, torso, head
- RTG ---> OpenGL

1.2 Structure of a body skeleton; representing a 3D body with 2D moves

1. The orientation

2. The computations for the absolute positions

A member is made of:

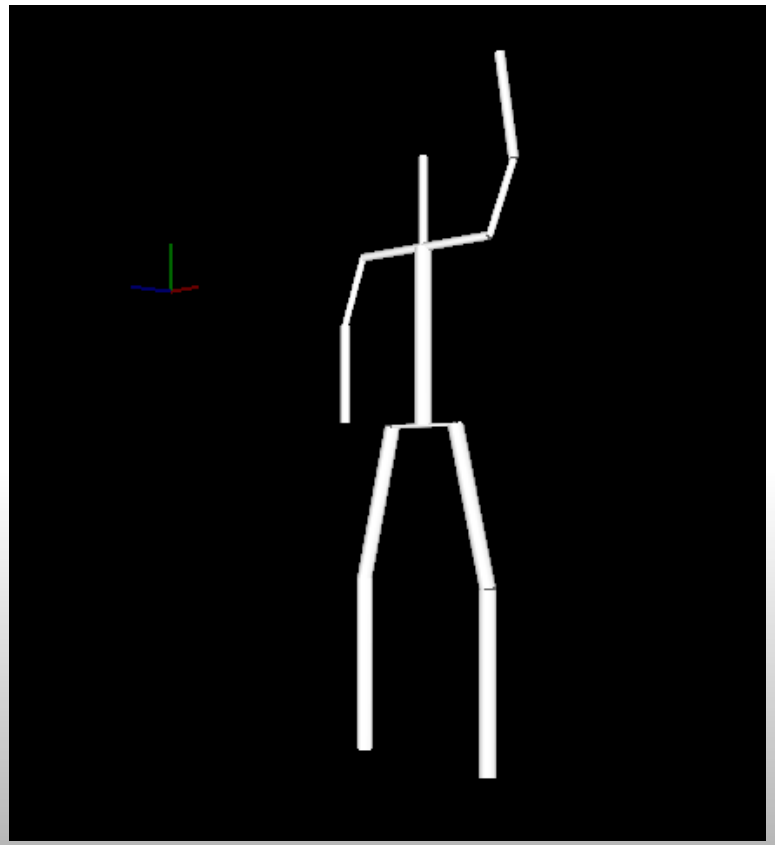
- **a pointer to the father *f***
- **the length of the member**.
- **the abscissa of fixation on *f*** ; if the value is:

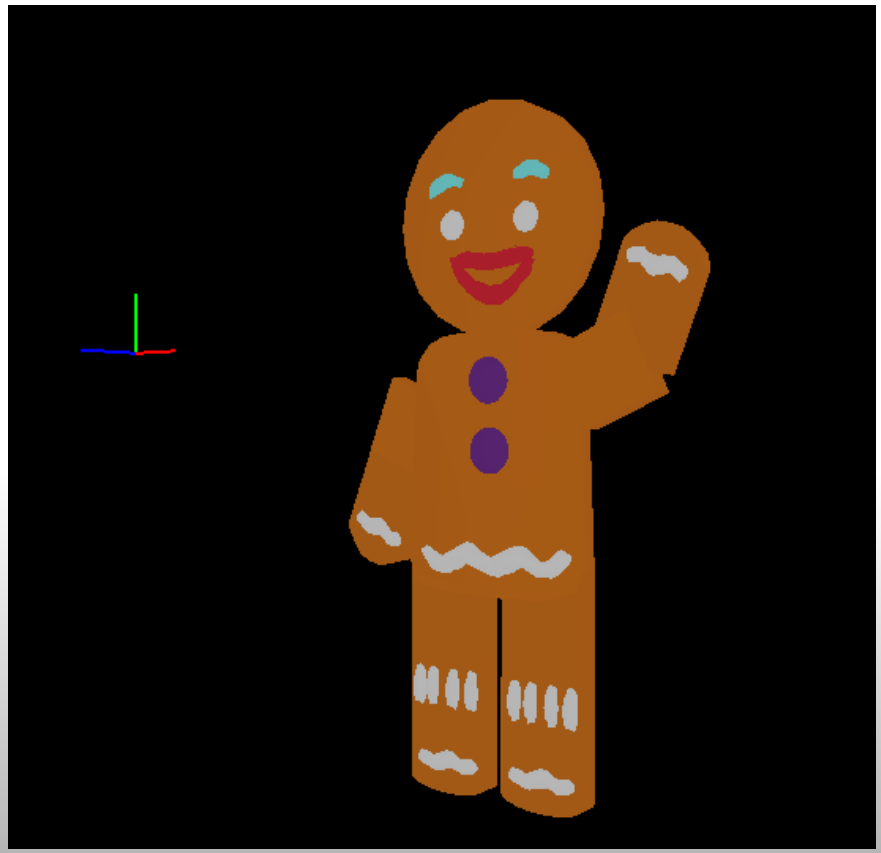
  - ***0*** -the member is fixated on the base of its father *f*
  - ***f.length/2*** **-** it is on the middle of *f*
  - ***f.length*** - the joint is at the end of *f*

- **the angle between *f* and the current member**

A member is made of (Cont.):

- **A pointer to the RTG file used to draw the member**. In case no file is specified, the member will be drawn with a white orientated cylinder.





2. Algorithms

2.1. Filtering the image

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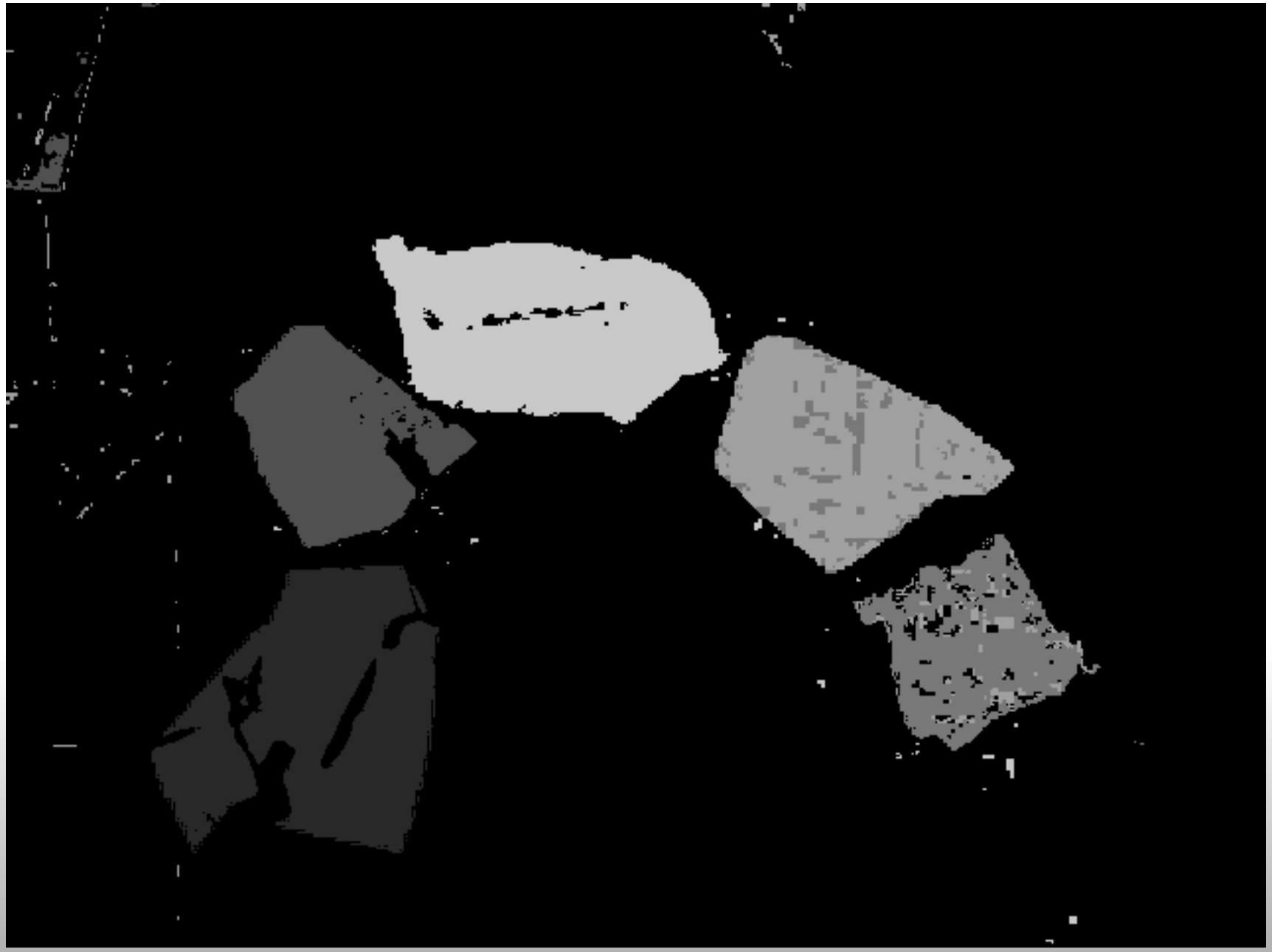
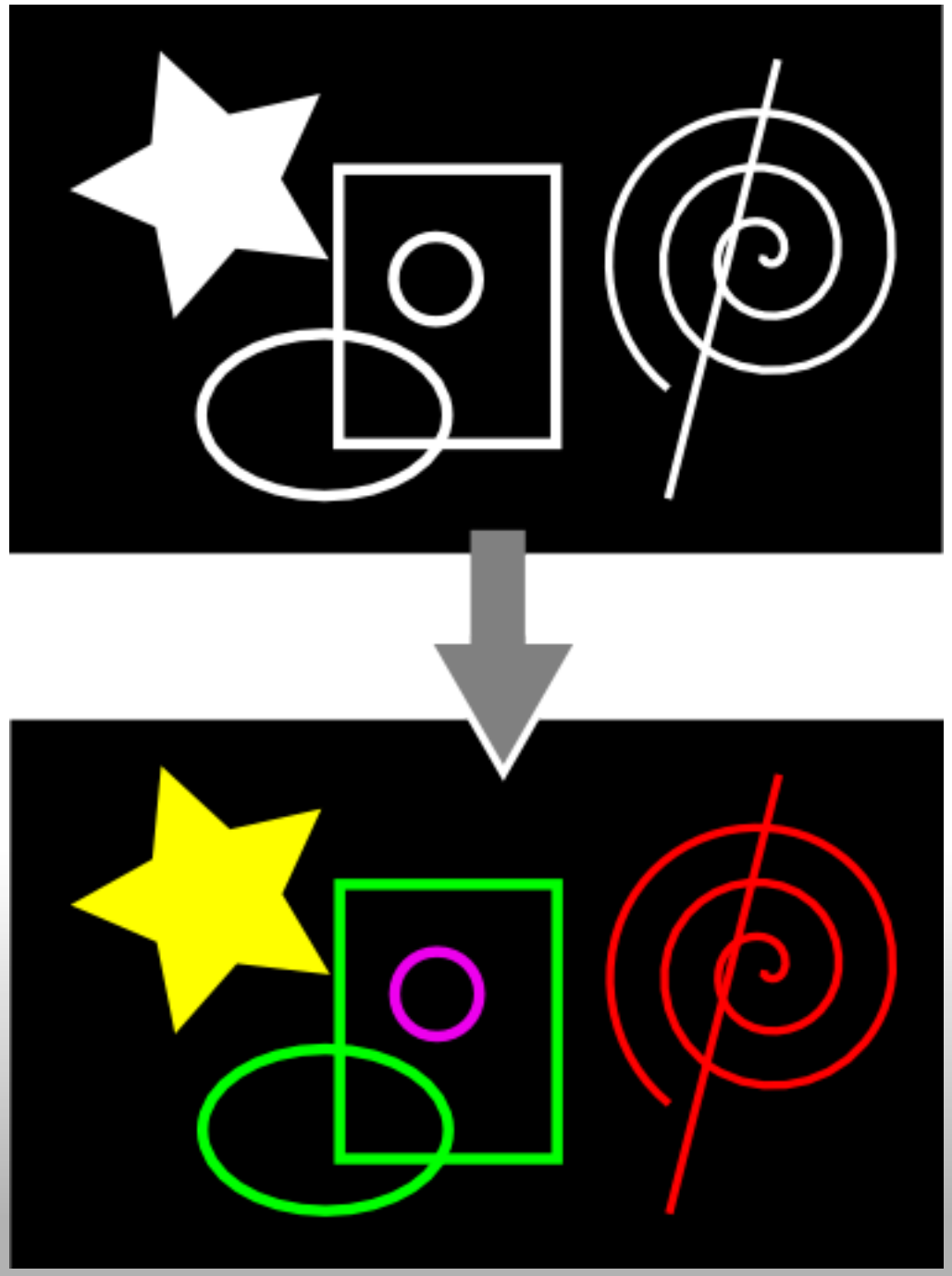


2.2. Computing the connected comps

What is a connected component ?



2.2. Computing the connected comps

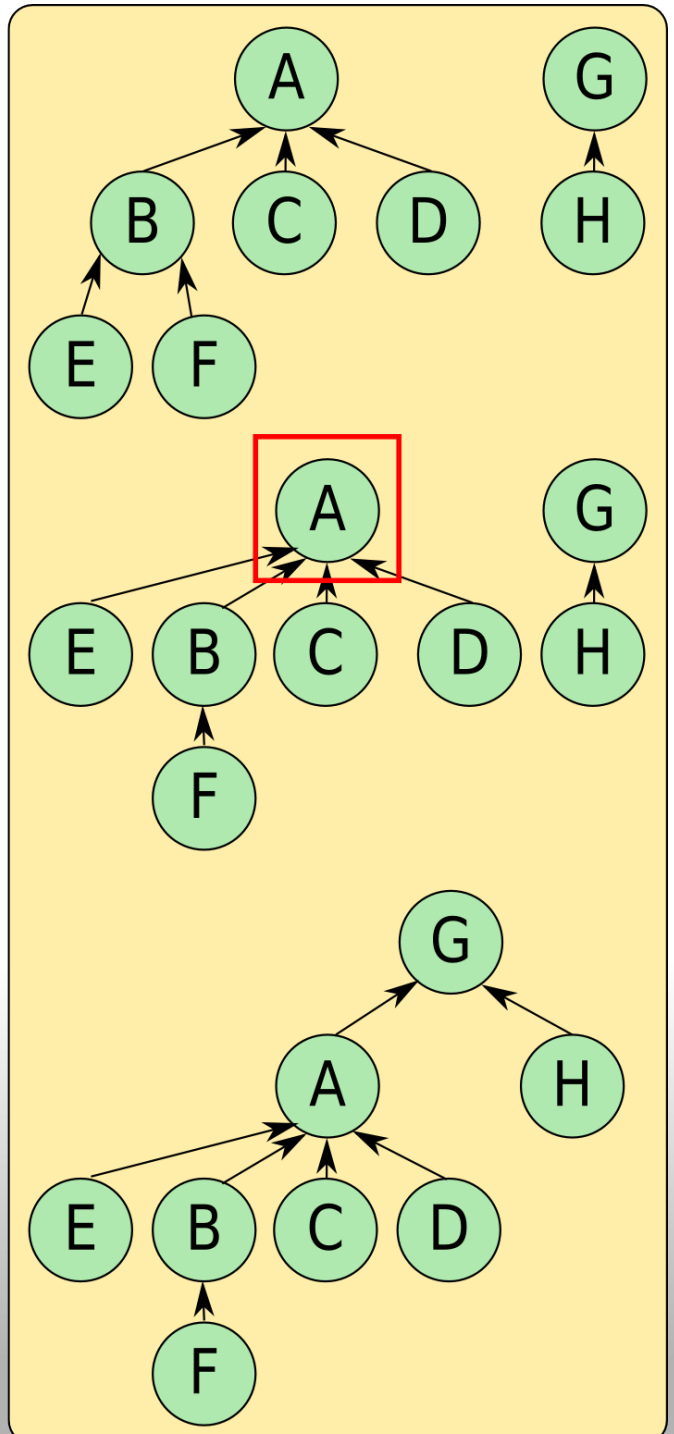
Method for computing them fast :
based on the
DisjointSets method

Initial situation :

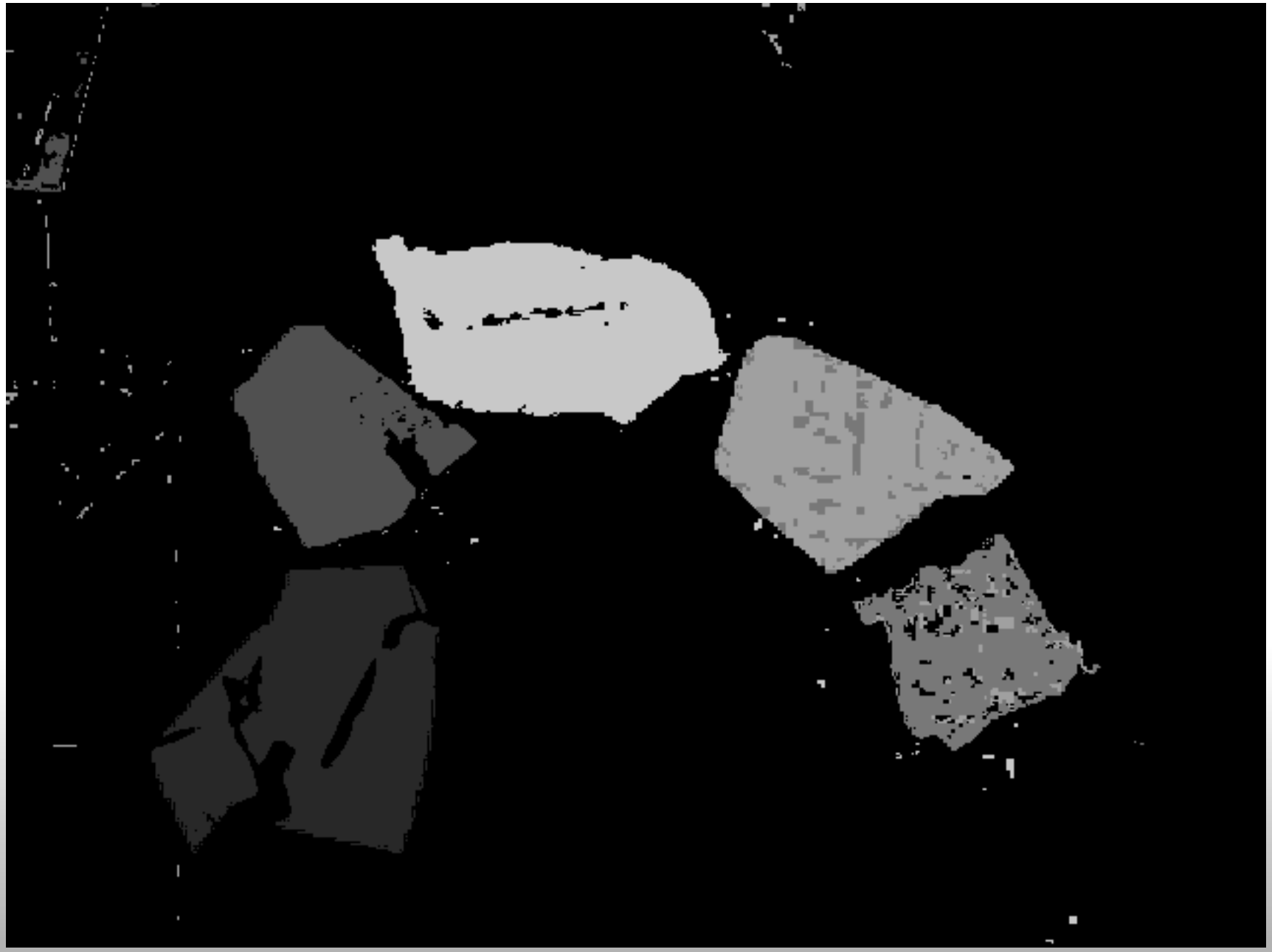
Find E *:*

Union E, H *:*

(if index A > index G)



2.3. Keeping the biggest comps



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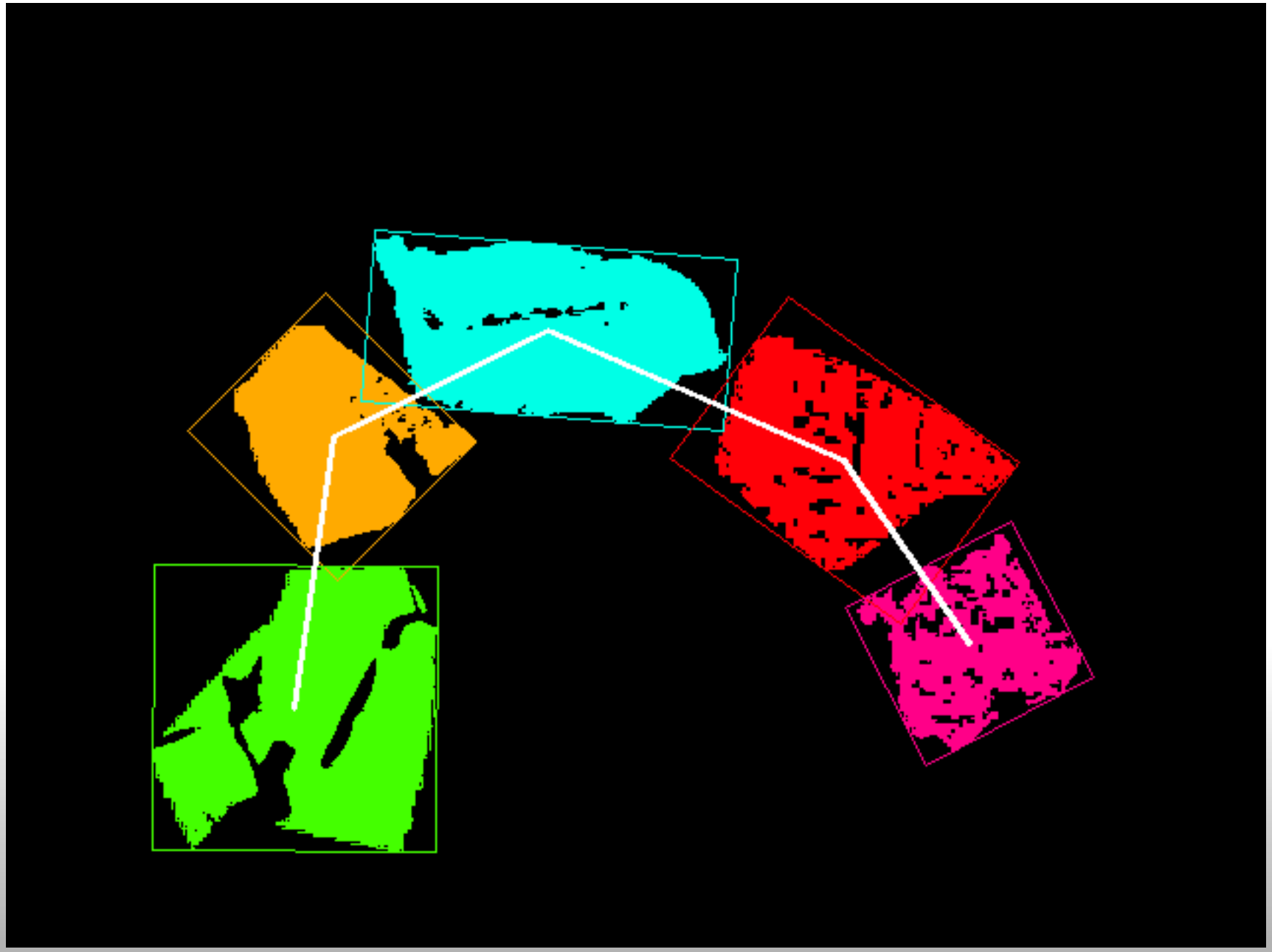
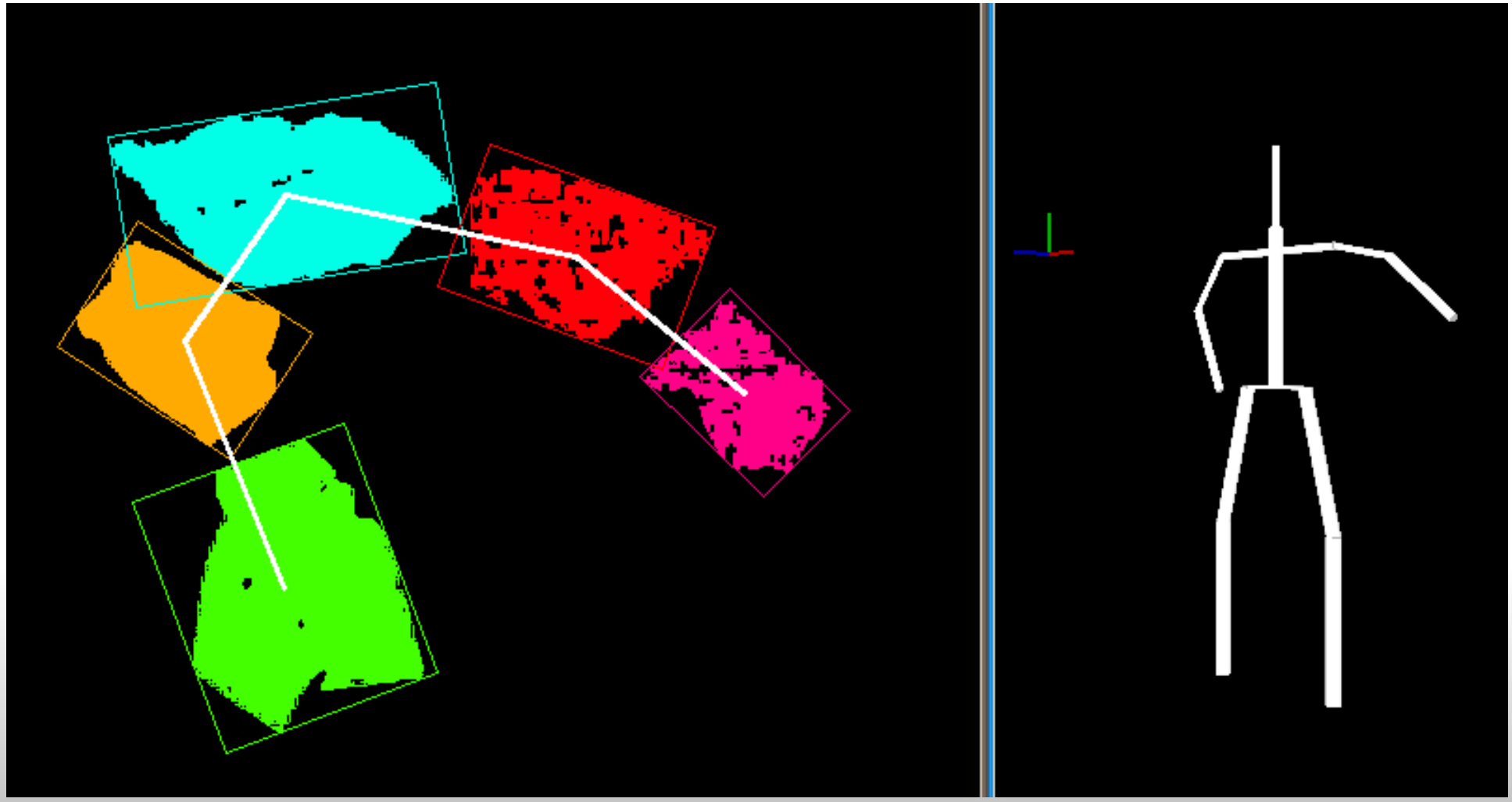


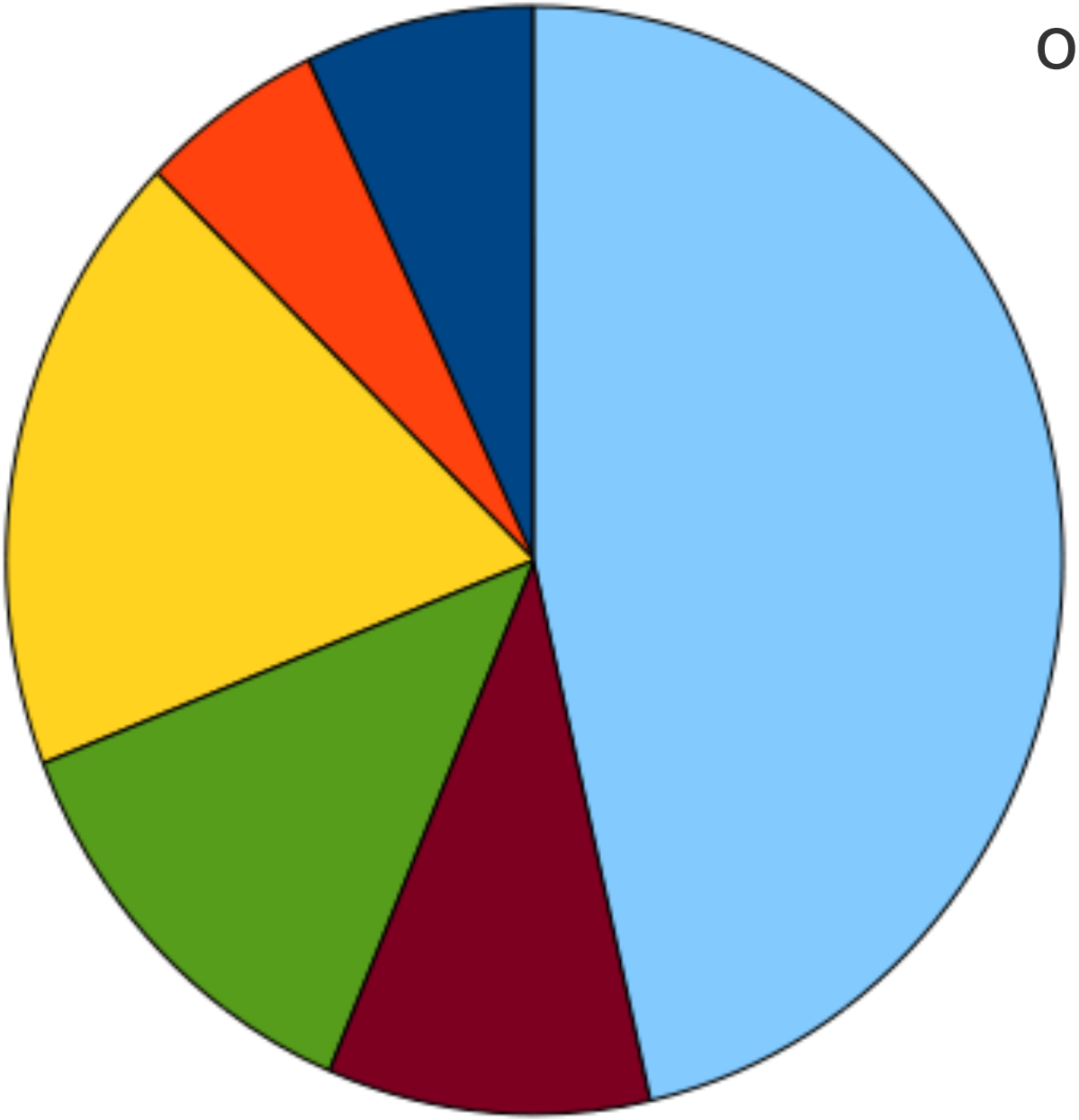
2.4. Sending data to OpenGL



3. Results

Time use

Average time :
60 ms / frame
on a VGA video



Demonstration

Conclusion

- easy solution for motion capture
- real-time
- limitations