

# COGNITO – The graphics and content delivery module

The goal of COGNITO system is to capture, analyze, store and render, with help of augmented reality (AR), complex industrial manual tasks. Due to its sensing and learning capability, the COGNITO system automatically creates workflow references by capturing (computer vision and on body sensor network) and processing user actions at learning time. As a task support tool, the system compares the user's activity in real-time, against the workflow reference, and provides adequate AR feedback.

This system is composed by four main modules (fig. 1). In this poster the graphics and content delivery module is presented, which implements one AR player. Additionally, the XML schema workflow representation, as a set of primitive events/actions, can be edited with one editing tool which enables non-programmers and non-3D-experts to prepare and accompany the composition of AR content visualizations for end-users.

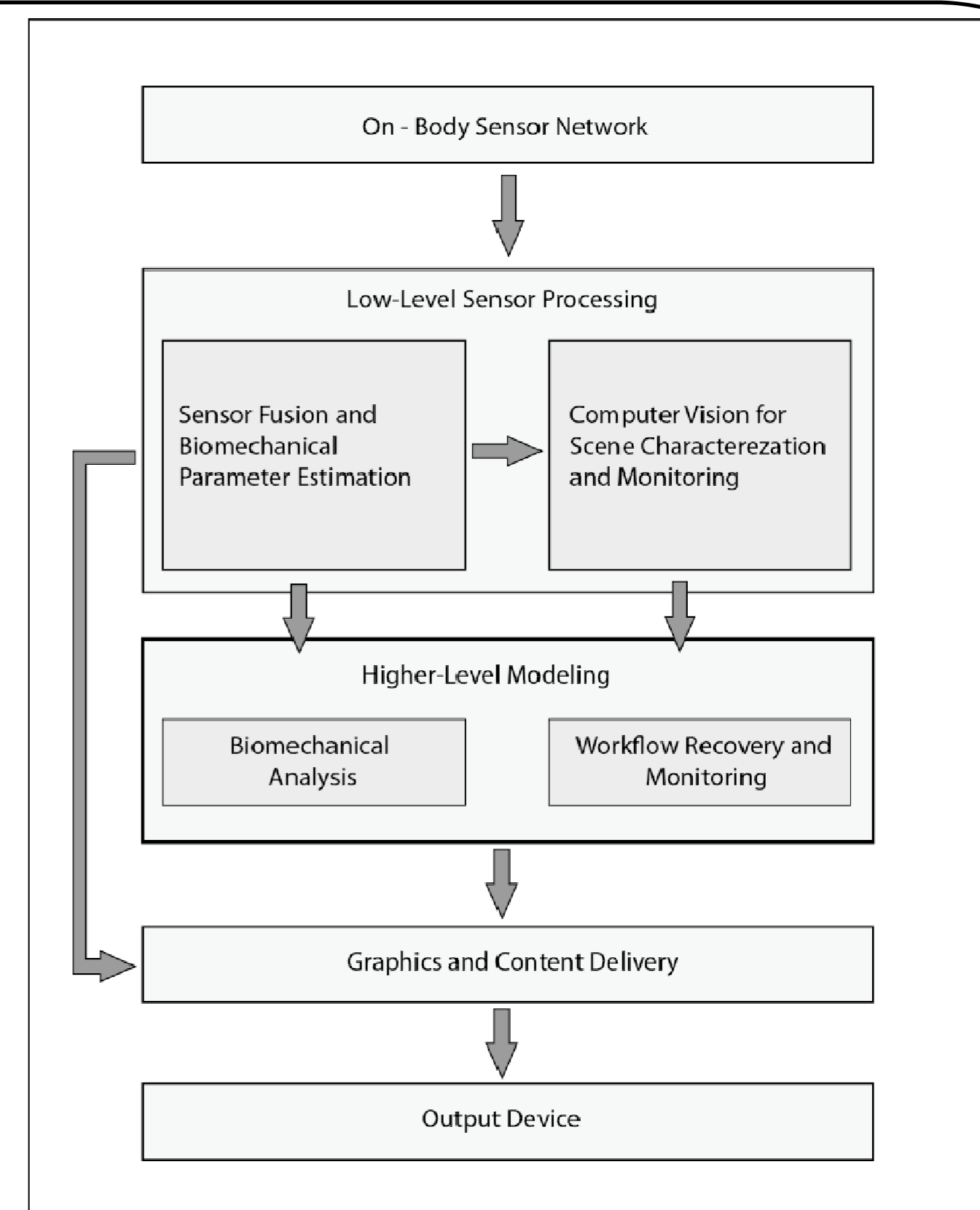


Figure 1 – COGNITO schematic representation

## The AR player

The player shows one sequence of multimedia instructions, step by step, instructing the user on the atomic tasks (PE) to be executed in order to accomplish the complete workflow. It presents a set of characteristics:

- The default set of multimedia consists of textual visualization of PE label, together with audio display of PE extended description and visualization of virtual elements highlighting the referenced key objects in the scene. All the information is displayed in the HMD equipment.
- The control may be performed either by the *Workflow Recovery and Monitoring module* (online mode) or by user's voice commands (user control mode).
- Body posture warnings display as feedback to instructions received from *Sensor Fusion and Biomechanical Parameter Estimation module*
- Voice recognition as input modality
- It implements geometrical algorithms and methods for the alignment and optimal positioning of AR elements

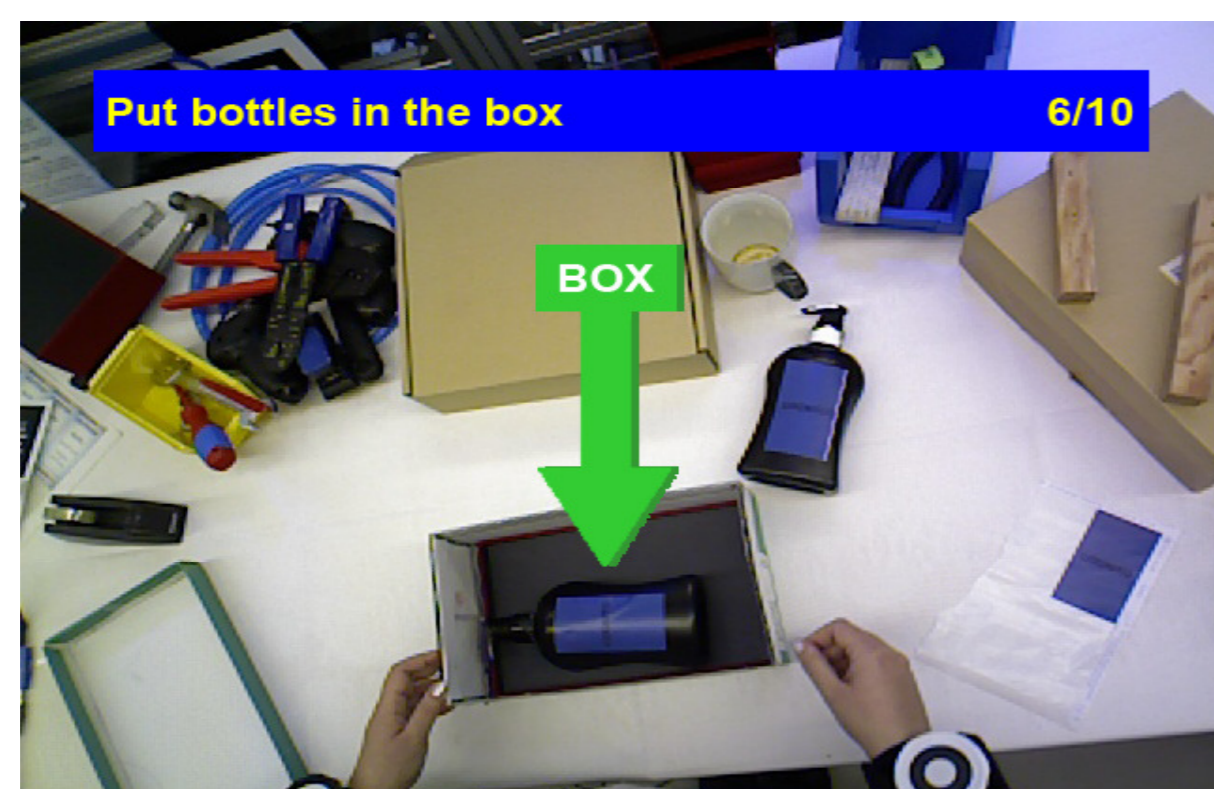


Figure 2 – Illustration of augmented information display

## The AR information editor

The editor's is used by experienced users to label and to add additional information to the PEs constituting the workflow identified and exported by the *workflow recovery and monitoring* module in the format of XML schema.

The editor is composed by three main areas (fig. 3):

- In the left upper corner a graphical hierarchical representation for the workflow is shown, which contains all PE and corresponding objects identified as present in the PE's scene.
- Every time one PE is selected on the left, on the right upper corner one video is displayed, as a way to support the correct PE identification and the corresponding labeling content to be added. These sequences of images, displayed as a video, are associated to each PE using associated timestamps.
- The PE data edition happens in lower area, where the user can add the textual label and the extended textual description for the selected PE. In this area the user may also add the corresponding multimedia content, to be displayed by the AR player.

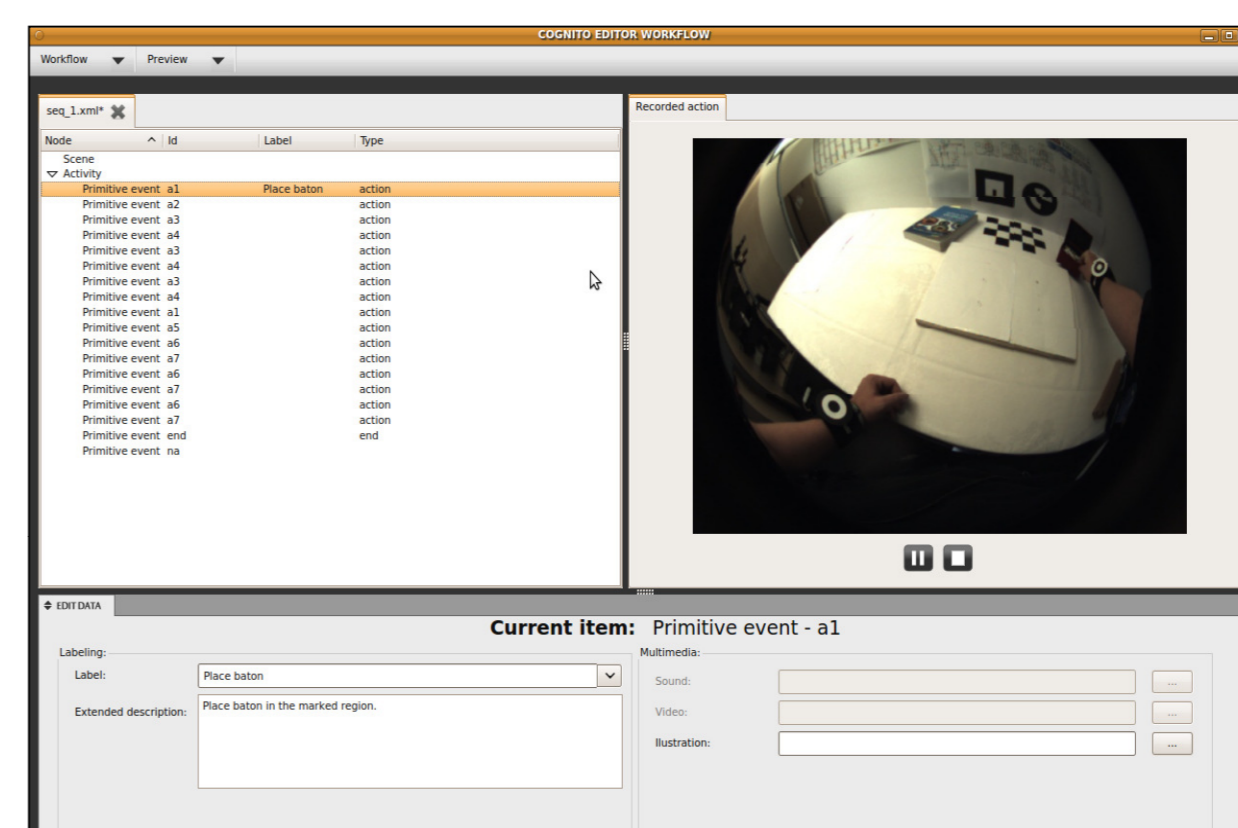


Figure 3 – Illustration of editor interface

## Authors and affiliation

\*Luis Almeida, \*Gustavo Mações, \*Hugo Domingues and #Luis Paulo Santos  
 \*Centro de Computação Gráfica, Guimarães, Portugal  
 {luis.almeida;gustavo.macaes;hugo.domingues}@ccg.pt

#Universidade do Minho – Dep. Informática, Braga, Portugal  
 psantos@di.uminho.pt

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## For more information visit:

<http://www.ict-cognito.org/index.html>

## Project Partners:



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