COGAR assignment – Ierardi Ambra, student ID 4843302

This document aims to explain the relationship among the software modules located in the component diagram and the threads in the activity diagram.

The sensor data thread corresponds to the sensor interface component, in which all the information concerning every sensor is stored runtime. The sensors used by the robot are a set of two cameras to have stereoscopic vision, a microphone to listen to human colleagues' instructions, tactile sensors to be aware of the kind of object it is handling, to decide how much pressure it should apply, an IMU comprehensive of accelerometer to get feedback on its motion.

The motion control thread includes the actuators component. In this software module, I decided to include not only the motor actuation, concerning the motion of the wheels and of the arms of the robot itself, but also the speaker module, because it is intended as a software component producing a physical (even if vocal) action of the robot to the environment (i.e. the colleagues).

The on-premises computation thread includes the 3D mapping module of the objects in the warehouse, the obstacle avoidance software, the tool and weight check respectively concerning the single item to be assembled and the whole car door and the assemble component. I decided to group all these modules in the on-premises computation since they are all computation modules, except for the assemble one, which is just a component module since it is a more generic block, and I think that they should be available at any time, due to their importance (see the obstacle avoidance, above all avoid crashing into a human colleague and hurting him/her).

The cloud-based computation thread includes the following components: optimize route, decide which colleague to call and interact with colleague. The reason for this choice is that they are all important modules but not essential: if cloud is momentarily not available, it can still take a route, even though not optimized, it can still call a colleague, maybe it will call the wrong one but still can call someone.

As final thread, the robot control encloses all the general control processes of the robot. It has not a specific component counterpart in the component diagram it controls the general behavior of the humanoid and some of its reasoning processes.