Subject 1 : Study implementation of a prototype trolley-follower of people
Subject 2 : Design and implementation of a prototype to help sort objects according to their colors “see their shapes”. using a TurtleBot-2i robot
Subject 3 : Implementation, using the Kuka urtleBot-2i or YOUBOT robot, of a loading and unloading system for tagged-RFID objects on a shelf.

Context : As part of an INTERREG project, the school of engineers, ICAM, in collaboration with other university partners (Isen, University of Lille1, CITC, University of Gent, University of Kent, University of Essex,. ) is engaged in the realization of several works namely:

setting up a pumping station management system via the cloud (Proficloud)
the study and realization of a smart grid energy management system (ProfiEnergy)
the study and realization of an IOT and robotic system in a warehouse type environment
But, we are interested in this project to systems using IOTs with mobile robotics. The KUKA mobile robot and the Turtlebot2i robot are robots with “Gripper” arms and forceps, often used for research. We have in this framework of these robots which are programmable platforms, omnidirectional equipped with an arm with 5 degrees of freedom, a scanner for the avoidance of obstacles and a camera of the type Xtion Pro (type Kintec ) for the identification and recognition of objects.

Research context: As part of the development of a research activity around mobility using IOT technologies: RFID, mobile robot , Ibeacons, indoor location ... we want to develop “Demonstrator/ Prototype” application in order to help operators of a warehouse to load / stack, optimally, boxes of different sizes on a pallet without the human intervention using the robots, any kind of robots supporting ROS.

Pedagogical context: The demonstrators developed in this framework will be used on the one hand to validate the “Pilot” prototype for the research projects developed at ICAM for industrialists and allows us on the other hand to set up new test benches. around these new technologies applicable in several areas. A phase of bibliographic study is necessary to properly address these topics.

Tools and materials that can be used for this project:

Modeling Object
ROS : Robotic Operating System
OPENCV
The development language : Python, C ++ or JAVA,
The Robots YOUBOT and TURTLEBOT2i under Ubuntu
Camera Xtion Pro
Obstacle avoidance scanner