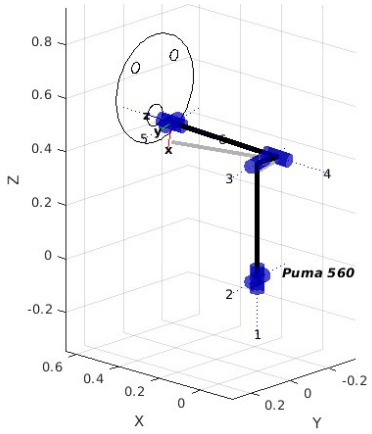
## Work assignment: Visual Servoing

The goal is to implement and simulate a robot performing an assistive task by means of visual servoing. Follow the next steps:

1. Choose the assistive task. An example to illustrate the scope and the expected level of difficulty is to feed a person, represented with a circular face and a mouth, with a robot that may hold a spoon. The robot moves the spoon from a dish to the person's mouth by means of visual servoing. The location of the face is unknown and can change for each execution of the program (within some reasonable range). This is just an example, you should design your own assistive application.




2. Choose a robot. Using the functions and scripts of the Matlab Robotics Toolbox, you need to define the model of a robot. You can use a standard robot or define the Denavit-Hartenberg (D-H) parameters.

3. Define a virtual camera to acquire the information. The controller requires in advance the definition of a target image (or several target images to follow a particular set of sequential motions), and the sequence of current images while running the visual servoing.

4. Implement a visual servoing method to follow the desired waypoints defined by target images. The assigned grade will also depend on the chosen method, in increasing order, to perform the visual sevoing task:

a) Pick and place: Using the initial and target image information for each motion, compute the corresponding initial and target Cartesian localization and execute the robotic control to reach the target location.

b) Position-Based Visual Servoing (PBVS).

c) Image-Based Visual Servoing (IBVS).

Possible optional tasks are based on the originality and versatility of the presented solution.