SW2URDF

A usefull Add-In for Solidworks

This is an add-in for Solidworks that allows to export a robot in urdf format

The add-in is available on http://wiki.ros.og/sw_urdf_exporter .

Installation instructions are given on the page and should work fine. Tutorial links are available at the bottom of the page.

The process is divided into two subphases:

1. The definition of the robot spawning tree and the attribution of the parts to the spawning tree links
2. The Joint and Link properties configuration

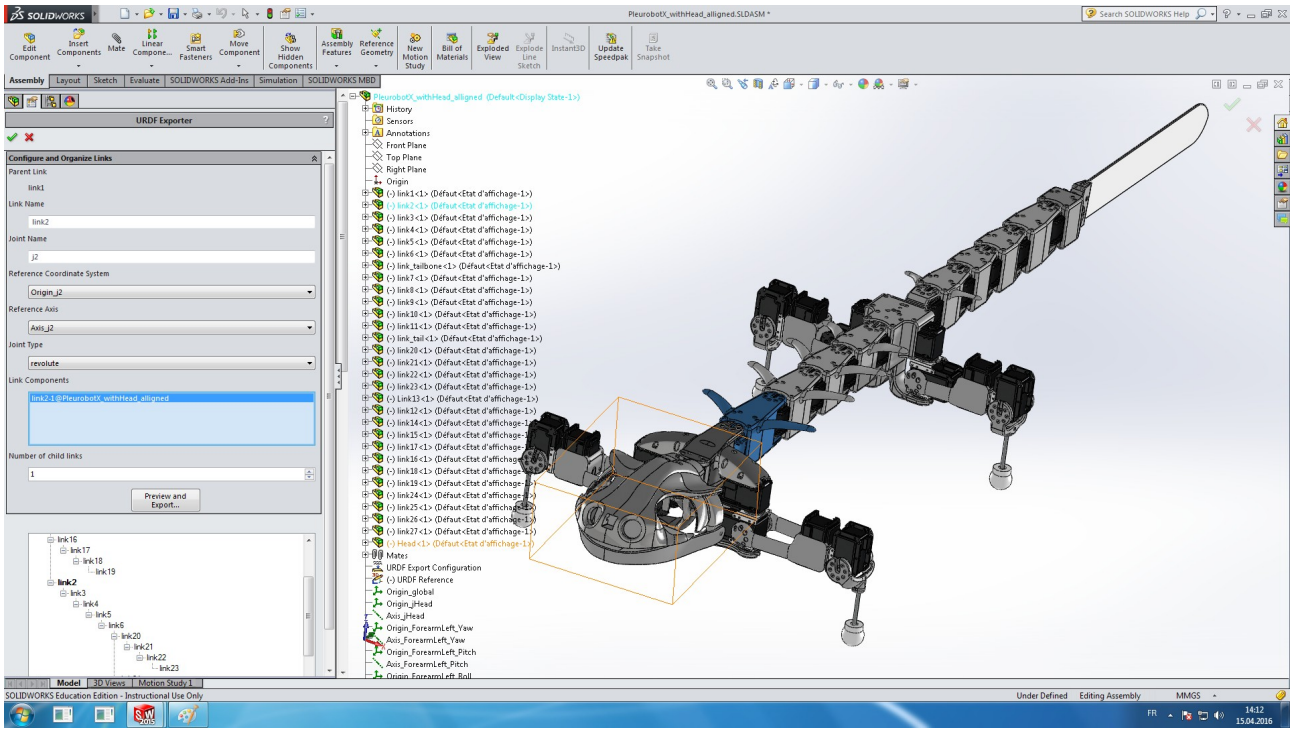

Illustration 1: Robot Spawning tree definition for Pleurobot

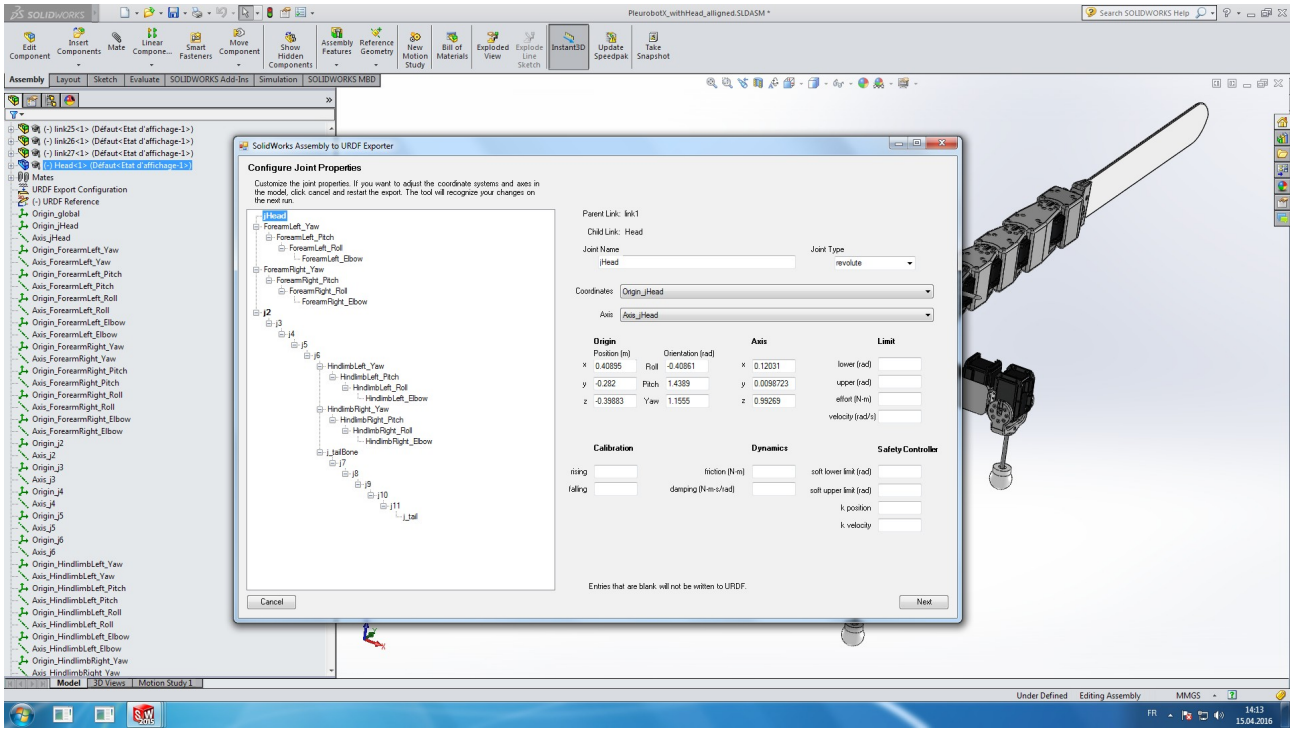

Illustration 2: Joint properties configuration for Pleurobot

A big advantage of the add-in is that once the spawning tree is defined, various elements are created in the SW tree for the urdf. These elements can be saved, simplifying things a lot for subsequent usage of the add-in.

Issues

The add-in has some issues (at least on SolidWorks 2015) and might not finish the creation of the urdf if the robot SW model is not configured properly. Because of this it is important to respect the following points to make sure everything goes smoothly.

- The urdf exporter works by allowing the user to create a tree structure for the robot with a base link, child links and joints between each parent/child couple. The user can then define which parts of the robot belong to which link. However clicking on the parts directly on the robot to do so will cause problems. Clicking on the subassemblies listed in the spawning tree works fine but this implies that the solidworks subassemblies have to correspond to the desired links.
- The robot's position will be considered by the exporter as being the default position for all joints once the urdf is created, it is thus important to have the robot in the desired configuration. This can be achieved by setting mates to straighten them out; however it is necessary to then remove the mates or they will prevent the exporter from recognizing the joint placements.
- In the configuration of joint and link properties part, changing the origin of the base-link has proven to create abnormalities. If one wishes to change these values, the

robot should be moved to the desired position relative to the actual SW environment origin.

- A lot of the fields do not need to be filled, this means the corresponding fields will not be added as attributes in the resulting urdf. Some importing tools might cause problems because of these missing items such as rviz.

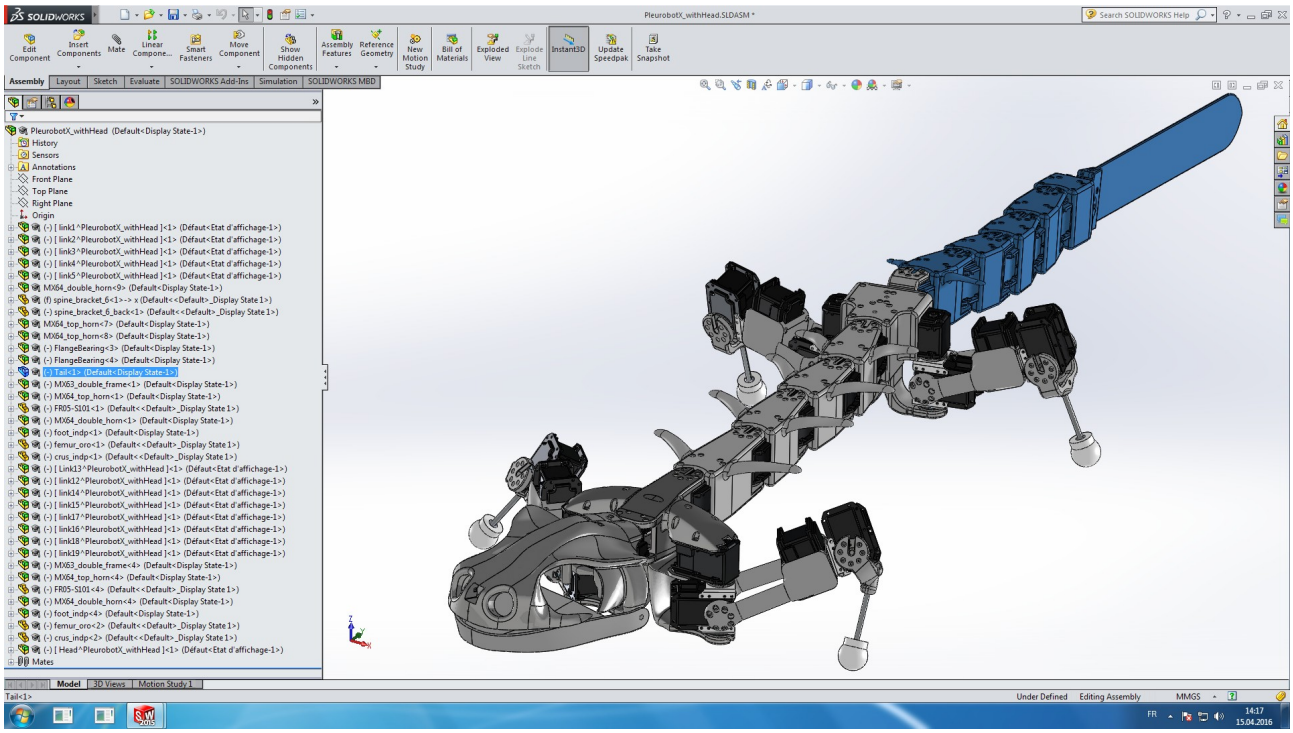

Illustration 3: Problematic robot for the exporter

In the previous illustration, the exporter will not be able to create a good urdf since the robot is not aligned to the default position. Moreover, since the tail is defined as one big subassembly, it will create problems when creating the spawning tree in the exporter.

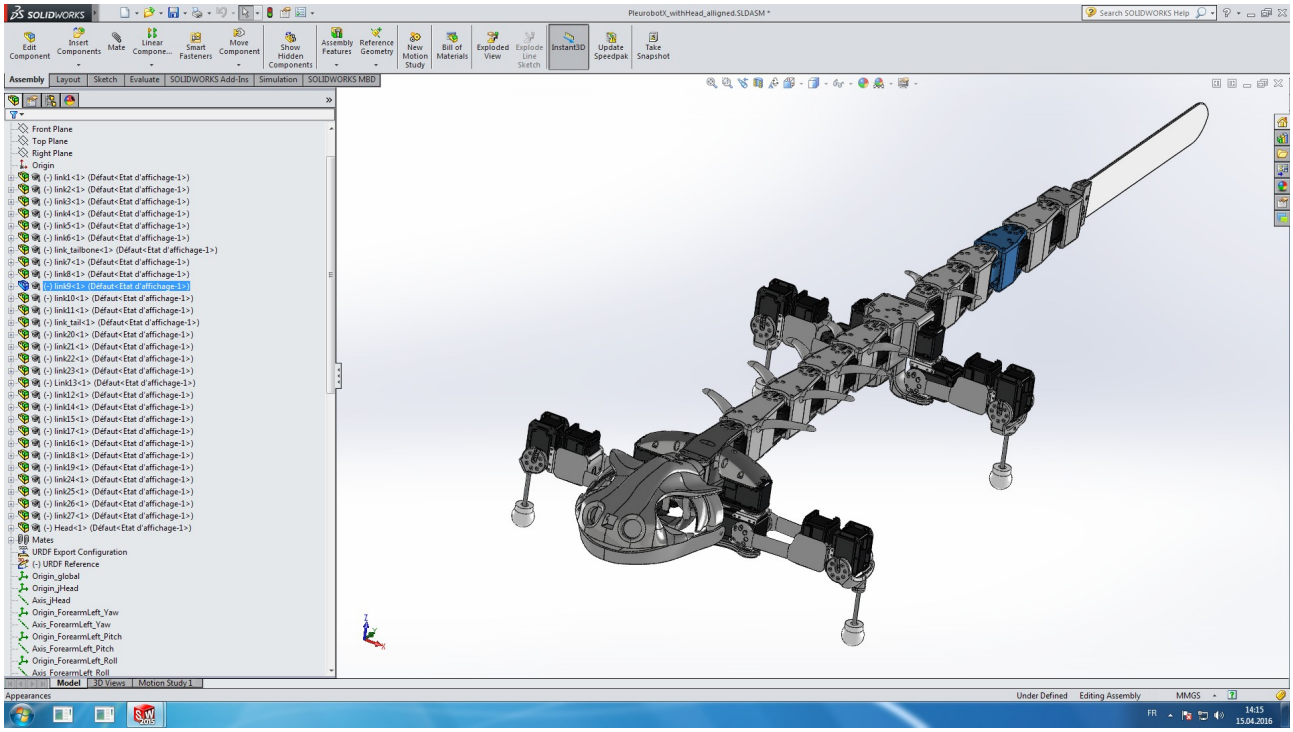

Illustration 4: Robot ready for export

In Illustration 4, the robot is straightened out in its zero position and all pieces have been separated in subassemblies corresponding to the links. The subbasemblies can then be selected very easily during exporting process as is shown in Illustration 1.

Additional material

If you wish to get the pleurobot SW files that have been prepared for the export, a gitlab group has been created. To have access send a request to lucien.troillet@gmail.com with your gitlab username.