Robot Description - Spyder robot - **URDF**

Name: Arakno v.0

Body components:

- trunk(body base): octagon
- upperleg: cylinder
- lowerleg: cylinder/arrow shape

Quantity:

- 1 trunk
- 4 legs

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Joints:

- shoulder_joint: revolute around z-axis
- upperleg_joint: revolute around y_axis
- lower_joint: revolute around y_axis

Quantity:

- 3 joints x leg

Joint limits:
The joint angle are expressed in radians

- shoulder_joint: [-0.785 0.785]
- upperleg_joint: [-0.785 0.785]
- lowerleg_joint: lower= [0.05 1.08] #0.05 as starting point to not ruin the servomotor if it want to reach 0

##

Mesh(components) dimensions in meters:

- trunk: 0.277 x 0.277 x 0.15
- shoulder: 0.08 x 0.08 x 0.01
- upperleg: 0.08 x 0.08 x 0.2
- lowerleg: 0.08 x 0.08 x 0.25

Weight:
All the masses are calculated by choosing ***Aluminium*** *as material.*

*The formula used is: m = ps * V,*
where V= volume of the component and ps = density = 2,7 g/cm³

- trunk: 25 kg
- shoulder: 0.135 kg
- upperleg: 2.71 kg
- lowerleg: 2.93 kg

Total weight: 25 + 4*(0.135 + 2.71 + 2.93) =~ 48 kg

##

Inertia calculation:
The formula used to calculate the inertia matrix of each component is a cuboid inertia matrix.

Formula:

$$I = \begin{bmatrix} \frac{1}{12}m(h^2+d^2) & 0 & 0 \\ 0 & \frac{1}{12}m(w^2+d^2) & 0 \\ 0 & 0 & \frac{1}{12}m(w^2+h^2) \end{bmatrix}$$