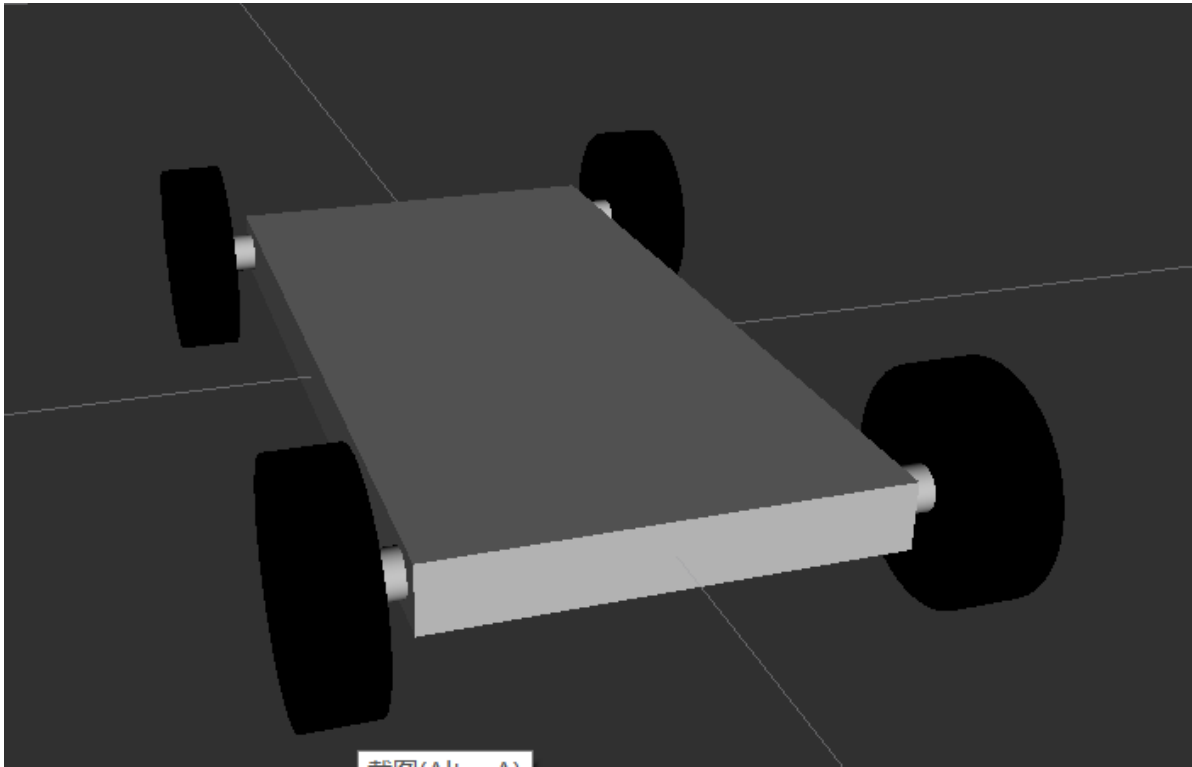


需求



分析

总共有7个部件，4个轮子，1个板子，2个联轴器。

抽象成urdf，则是有7个link。

这个7个link是通过6个joint结合在一起的。

其中，板子和2个联轴器属于固定连接在一起的。

联轴器和4个轮子是通过旋转方式连接在一起的。

实现

```
1 <?xml version="1.0" encoding="UTF-8" ?>
2 <robot xmlns:xacro="http://www.ros.org/wiki/xacro" name="joint1">
3
4     <material name="black">
5         <color rgba="0 0 0 0.8"/>
6     </material>
7
8     <material name="grey">
9         <color rgba="0.8 0.8 0.8 0.8"/>
10    </material>
11
12    <xacro:property name="pi" value="3.1415926"/>
13    <xacro:property name="d_180" value="${pi}"/>
14    <xacro:property name="d_90" value="${pi/2}"/>
15
16    <xacro:property name="board_x" value="0.4"/>
17    <xacro:property name="board_y" value="0.2"/>
```

```

18     <xacro:property name="board_z" value="0.03"/>
19
20     <xacro:property name="extra_len" value="0.02"/>
21     <xacro:property name="extra_radius" value="\${board_z/3}"/>
22
23     <xacro:property name="wheel_width" value="0.03" />
24     <xacro:property name="wheel_radius" value="0.05" />
25
26     <xacro:macro name="HMBox" params="name xyz='0 0 0' rpy='0 0 0' size
color='grey'">
27         <link name="\${name}">
28             <visual>
29                 <origin xyz="\${xyz}" rpy="\${rpy}"/>
30                 <geometry>
31                     <box size="\${size}"/>
32                 </geometry>
33                 <material name="\${color}"/>
34             </visual>
35         </link>
36     </xacro:macro>
37
38     <xacro:macro name="HMCylinder" params="name xyz='0 0 0' rpy='0 0 0'
length radius color='grey'">
39         <link name="\${name}">
40             <visual>
41                 <origin xyz="\${xyz}" rpy="\${rpy}"/>
42                 <geometry>
43                     <cylinder length="\${length}" radius="\${radius}"/>
44                 </geometry>
45                 <material name="\${color}"/>
46             </visual>
47         </link>
48     </xacro:macro>
49
50     <xacro:macro name="HMJoint" params="name type='fixed' parent child
xyz='0 0 0' rpy='0 0 0' axis='1 0 0'">
51         <joint name="\${name}" type="\${type}">
52             <parent link="\${parent}"/>
53             <child link="\${child}"/>
54             <origin xyz="\${xyz}" rpy="\${rpy}"/>
55             <axis xyz="\${axis}"/>
56         </joint>
57     </xacro:macro>
58
59     <!-- link -->
60     <xacro:HMBox name="base" size="\${board_x} \${board_y} \${board_z}"/>
61
62     <!-- link -->
63     <xacro:HMCylinder name="front"
64         length="\${extra_len * 2 + board_y}"
65         radius="\${extra_radius}"
66         rpy="\${d_90} 0 0" />
67
68     <xacro:HMJoint name="joint0"
69         parent="base"
70         child="front"
71         xyz="\${board_x/2 - extra_len} 0 0" />
72

```

```

73 <!-- link -->
74 <xacro:HCylinder name="back"
75     length="${extra_len * 2 + board_y}"
76     radius="${extra_radius}"
77     rpy="${d_90} 0 0" />
78
79 <xacro:HJoint name="joint1"
80     parent="base"
81     child="back"
82     xyz="-${board_x/2 - extra_len} 0 0" />
83
84 <xacro:macro name="HMwheel" params="name left='true'">
85     <xacro:if value="${left}">
86         <xacro:HCylinder name="${name}"
87             length="${wheel_width}"
88             radius="${wheel_radius}"
89             xyz="0 ${wheel_width/2} 0"
90             rpy="${d_90} 0 0"
91             color="black" />
92     </xacro:if>
93     <xacro:unless value="${left}">
94         <xacro:HCylinder name="${name}"
95             length="${wheel_width}"
96             radius="${wheel_radius}"
97             xyz="0 -${wheel_width/2} 0"
98             rpy="${d_90} 0 0"
99             color="black" />
100     </xacro:unless>
101
102 </xacro:macro>
103
104 <xacro:HMwheel name="wheel_front_left"/>
105
106 <xacro:HJoint name="joint2"
107     parent="front"
108     child="wheel_front_left"
109     type="continuous"
110     xyz="0 ${board_y/2 + extra_len} 0"
111     axis="0 1 0" />
112
113 <xacro:HMwheel name="wheel_front_right" left="false"/>
114
115 <joint name="joint3" type="continuous">
116     <parent link="front"/>
117     <child link="wheel_front_right"/>
118     <origin xyz="0 -0.12 0" rpy="0 0 0"/>
119     <axis xyz="0 1 0"/>
120 </joint>
121
122 <xacro:HMwheel name="wheel_back_left"/>
123
124 <joint name="joint4" type="continuous">
125     <parent link="back"/>
126     <child link="wheel_back_left"/>
127     <origin xyz="0 0.12 0" rpy="0 0 0"/>
128     <axis xyz="0 1 0"/>
129 </joint>
130

```

```
131     <xacro:HMwheel name="wheel_back_right" left="false"/>
132
133     <joint name="joint5" type="continuous">
134         <parent link="back"/>
135         <child link="wheel_back_right"/>
136         <origin xyz="0 -0.12 0" rpy="0 0 0"/>
137         <axis xyz="0 1 0"/>
138     </joint>
139
140 </robot>
```