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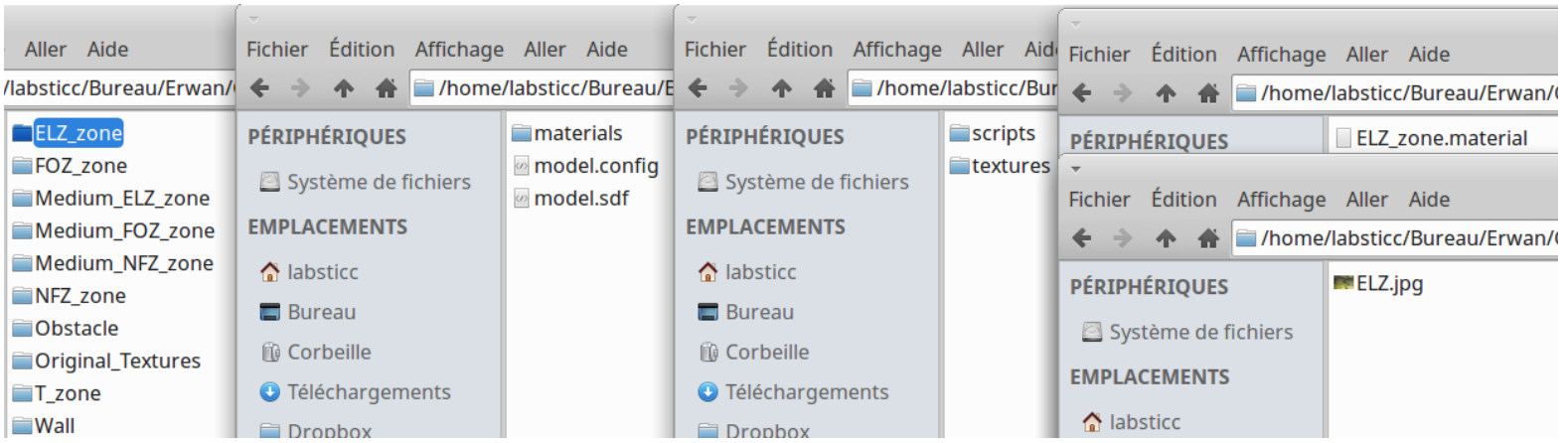
Toolbox to create scenario environment in Gazebo

This file contains explanations about the Gazebo toolbox to create environments for HpeC drone tests. First of all, there are some details about how to use the toolbox. Then, there is a tutorial on how to create/custom his own objects to augment the toolbox.

1 Toolbox description

This is a bank of Gazebo objects you can use and add them into your .world. It contains objects that are often useful for the HPeC drone experiments such as a T-zone for landing, an obstacle and other useful surfaces. Before using the toobox, you have to know the file structure of an object.

In the main folder of the toolbox you can see several sub-folders which each describe an object. The name of the folder define the name of the object. In each of these folder you always find the same structure. Let's take the example of the object ELZ_zone (Emergency Landing Zone) object below:



- ./modef.sdf: describes the object

- ./model.config: meta-data of the object, author name etc…

- ./materials/scripts/ELZ_zone.material: script that calls the texture to put on the object

- ./material/textures/ELZ.jpg: texture of the object (does not work with .png format)

2 How to use the toolbox

2.a) Configure the toolbox

First of all, find the XML <**script**> tag in the model.sdf of the object you want to use. Then, update the path of highlighted lines according to your file structure:

mybot.world | iris_arducopter_demo3.world | model.sdf | model.config

```
16                <ode>
17                  <mu>100</mu>
18                  <mu2>50</mu2>
19                </ode>
20              </friction>
21            </surface>
22          </collision>
23          <visual name='FOZ_zone_link_Visual'>
24            <pose>0 0 0 0 -0 0</pose>
25            <geometry>
26              <box>
27                <size>1 1 0.05</size>
28              </box>
29            </geometry>
30            <scale>1 1 1</scale>
31            <material>
32              <script>
33                <uri>model:///home/labsticc/Bureau/Erwan/Gazebo/FOZ_zone/materials/scripts</uri>
34                <uri>model:///home/labsticc/Bureau/Erwan/Gazebo/FOZ_zone/materials/textures</uri>
35                <name>FOZ_zone/Diffuse</name>
36              </script>
37              <ambient>1 1 1 1</ambient>
```

2.b) Add the object in Gazebo

In your .world file (which is an .sdf file), copy the following lines (from 154 to 160) to add any objects:

mybot.world | iris_arducopter_demo3.world | model.sdf | model.config

```
152      </model>
153
154      <model name="FOZ_zone">
155        <include>
156          <uri>model:///home/labsticc/Bureau/Erwan/Gazebo/FOZ_zone</uri>
157          <pose>-2 2 0 0 0 0</pose>
158          <name>"FOZ_zone"</name>
159        </include>
160      </model>
161
```

Let’s talk about these tags in detail:

- model name : is the name of your object

- uri: the location of your object

- pose: specify its location in the world (x y z r p y)

- <name>: the instance name in Gazebo because you can call several times the same object

DO NOT FORGET to update the uri path according to your setup.

3 How to create an object with a texture

I will give you the easiest way to start:

1) Copy an object folder and rename it as you wish

2) Update the object name in each file in the folder

3) Modify the model.sdf file according to your needs to create an object, go to this link for more details about .sdf http://sdformat.org/spec

4) Put your texture picture (use .jpg or .jpeg) in the /texture folder

5) Update the .material file with the right texture to call

6) Put your new object in your gazebo’s .world file (see 2.b)

7) Enjoy the view of your first gazebo object!