Multi-Agent System in a disaster scenario (Pyson)

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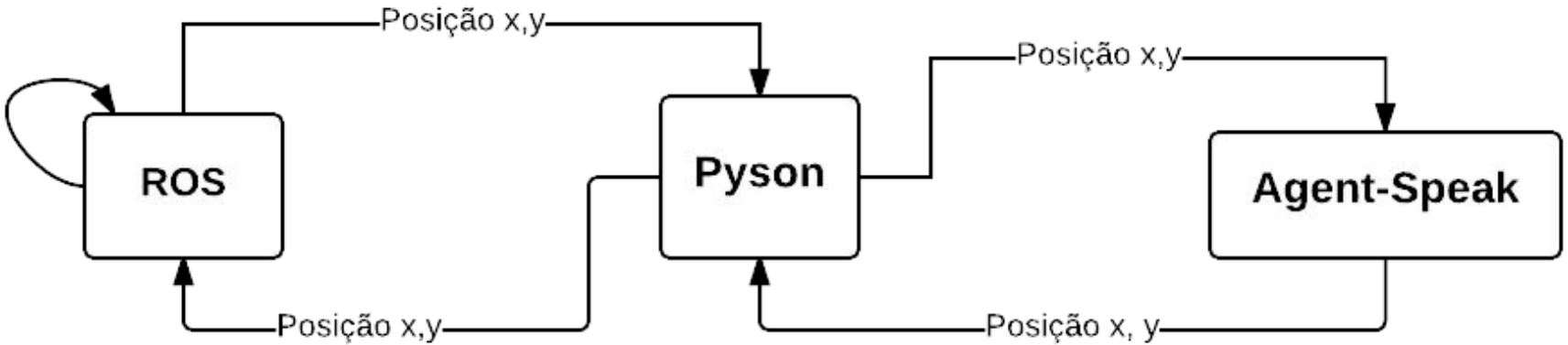
Why Pyson?

AgentSpeak-Py was not working with our plans.

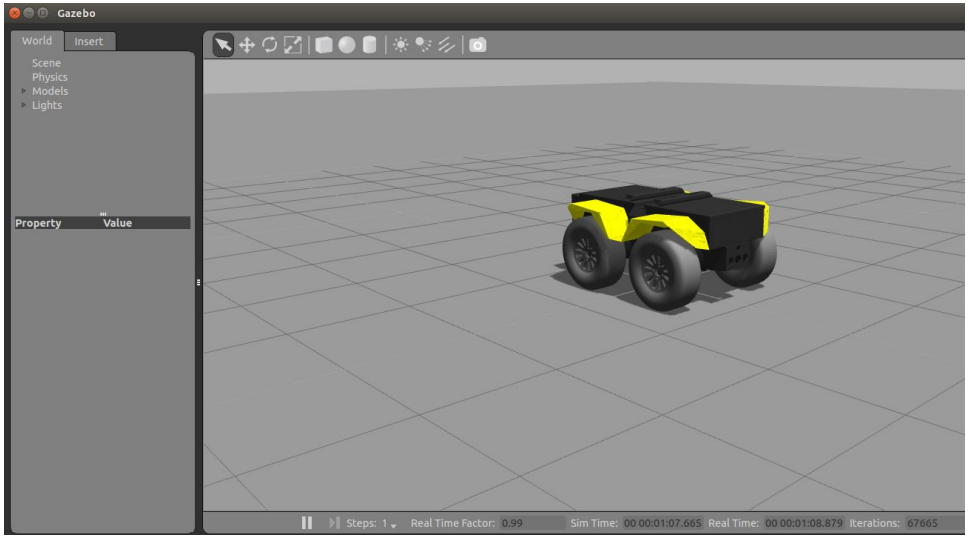
- Too many conditionals confused the interpreter

Architecture



Grizzly simulator

- https://github.com/g/grizzly_simulator
- Package for odometry node
- Ubuntu 14.04



Grizzly simulator

Odometry:

catkin_create_pkg <package-name>

Launch file:

<node pkg="check_odom" type="check_odometry" name="agent_subscriber.py" output="screen" >

Subscriber:

rospy.init_node('check_odometry')
odom_sub = rospy.Subscriber('/odom', Odometry, callback)

Launch

```
<group ns="robot2">
  <param name="tf_prefix" value="/" />
    <include file="$(find grizzly_gazebo)/launch/base_gazebo.launch">
      <arg name="description" value="$(arg description)" />
      <arg name="init_pose" value="-x 2 -y 2 -z 0" />
      <arg name="robot_name"  value="robot2" />
    </include>

    <include file="$(find grizzly_motion)/launch/motion.launch">
      <arg name="simulate" value="true" />
    </include>

    <include file="$(find grizzly_navigation)/launch/localization.launch"/>
</group>
```

Code

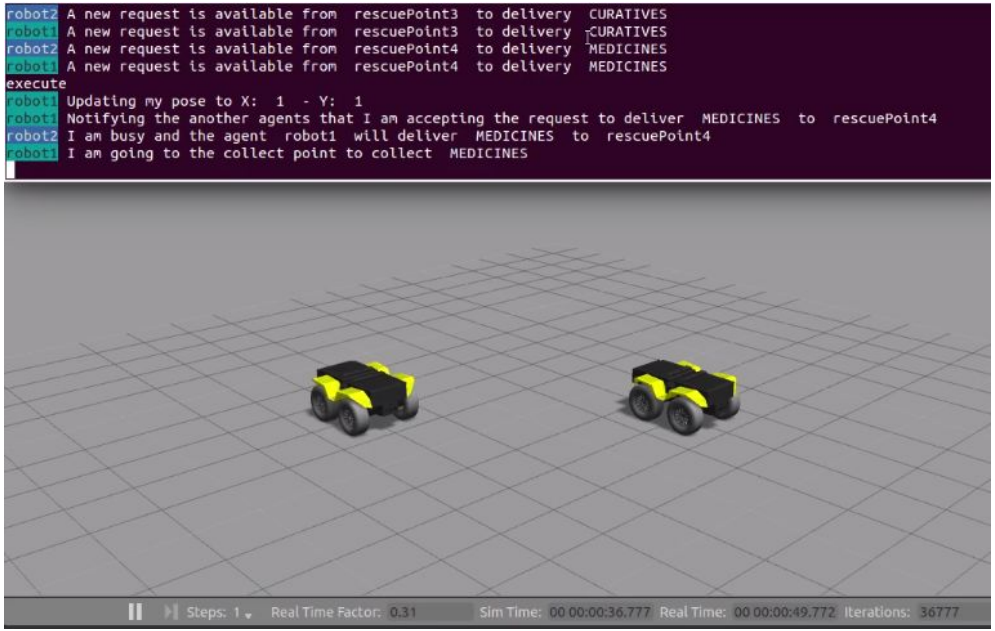
```
def execute():
        print "execute"
                # Here we are adding the "execute" literal to the belief base of the agents
        term = pyson.Literal("execute", (1, 1))
        intention = pyson.runtime.Intention()
        deliveryAgent1.call(pyson.Trigger.addition, pyson.GoalType.belief, term, intention)
        env.run()

        term = pyson.Literal("execute", (5, 6))
        intention = pyson.runtime.Intention()
        deliveryAgent2.call(pyson.Trigger.addition, pyson.GoalType.belief, term, intention)
        env.run()
```

Code publisher

```
@actions.add_function(".go_to", (int,int, pyson_str))
def go_to(x,y, name):
        agent = AgentPublisher(x, y, name)
        return 1
```

Running


robot2 A new request is available from rescuePoint3 to delivery CURATIVES
robot1 A new request is available from rescuePoint3 to delivery CURATIVES
robot2 A new request is available from rescuePoint4 to delivery MEDICINES
robot1 A new request is available from rescuePoint4 to delivery MEDICINES
execute
robot1 Updating my pose to X: 1 - Y: 1
robot1 Notifying the another agents that I am accepting the request to deliver MEDICINES to rescuePoint4
robot2 I am busy and the agent robot1 will deliver MEDICINES to rescuePoint4
robot1 I am going to the collect point to collect MEDICINES
Steps: 1
Real Time Factor: 0.31
Sim Time: 00 00:00:36.777
Real Time: 00 00:00:49.772
Iterations: 36777

Limitations

- Unable to process the PUCRS map
- Directions are unstable.

Links

- GitHub
  - https://github.com/disaster-robotics-proalertas/pucrs_campus_gazebo/tree/master/src/pyson
- Documentation
  - http://pucrs-campus-on-gazebo.readthedocs.io/en/latest/source/pyson/index.html
  - https://github.com/disaster-robotics-proalertas/pucrs_campus_gazebo/tree/master/src/agentspeak/Pyson (only Pyson)
- Demo
  - https://github.com/disaster-robotics-proalertas/pucrs_campus_gazebo/blob/master/src/pyson/demo.mp4
- Grizzly
  - https://github.com/disaster-robotics-proalertas/pucrs_campus_gazebo/tree/master/launch/grizzly