ROS.org

Simulation in ROS

Stage

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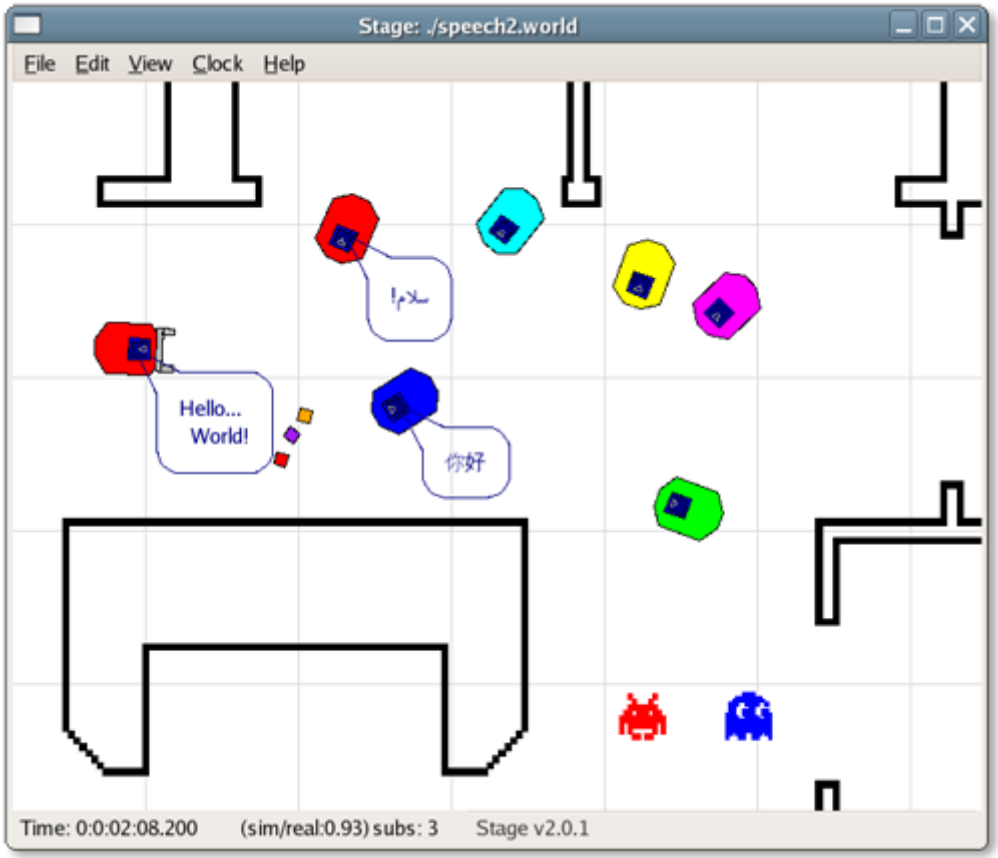
Stage

- Trade-off between high-fidelity simulations and grid-world simulations
- fast enough to simulate large populations
- Noise is obtained indirectly through discretization



http://rtv.github.com/Stage/

How to Configure Stage

Stage simulates a **world** composed of **models**, defined in a *world file*.

rosrun stage stageros `rospack find stage`/world/willow-erratic.world

1. **Wordfile properties** (interval_sim, resolution, quit_time,...)
2. **GUI properties** (*window* block)
3. **Models**:
   - Actuator
   - Blinkenlight
   - Blobfinder
   - Camera
   - Fiducial detector
   - Gripper
   - Position
   - Ranger

ROS and Stage

ROS embeds the Stage simulator through the Stage package

- *stageros* node wraps Stage 4.1.1 simulator
- Syntax: *rosrun stage stageros [-g] <world_file>*

Published Topics

- **odom** [*nav_msgs/Odometry*] odometry data from the position model
- **base_scan** [*sensor_msgs/LaserScan*] scans from the laser model
- **base_pose_ground_truth** [*nav_msgs/Odometry*] ground truth pos

Subscribed Topics

- **cmd_vel** [geometry_msgs/Twist] velocity commands to differentially drive the position model of the robot

ROS and Stage

Parameters

- **use_sim_time** [*bool*]

tf Transforms

- **base_link** → **base_laser** transform from robot base to attached laser
- **base_footprint** → **base_link** identity transform
- **odom** → **base_footprint** transform from odometric origin to base

Simulating one Robot in Stage

Setup

1. If necessary, build the *stage* package (rosdep, rosmake,...)
2. Install the *ros-fuerte-erratic-robot* package (on Ubuntu-like distros, type: *sudo apt-get install ros-fuerte-erratic-robot*)
3. Update the ROS package DB (rospack profile)
4. Run (following this order):
   - roscore
   - *stageros* in *stage* package (with *willow-erratic.world* map)
   - *erratic_keyboard_teleop* in *erratic_teleop* package
5. What about creating a launch file? (Homework)
6. *rosrun rviz rviz -d `rospack find rp_tutorial`/rviz/stage.vcg*
7. Add *rviz* in your launch file (Homework)