

TurtleBot3 MatLab/ROS Interface

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% Start ROS Connection
IP_TURTLEBOT = "192.168.1.xxx";      % virtual machine IP (or robot IP)
IP_HOST_COMPUTER = "192.168.1.xxx";  % local machine IP
tbot = TurtleBot3(IP_TURTLEBOT, IP_HOST_COMPUTER);

% move robot - send linear (v) and angular (w) velocity commands
tbot.move(v, w);
    v - [m/s]; (v>0) move forward; (v<0) move backward; (v=0) stop.
    w - [rad/s]; (w>0) rotate anti-clockwise; (w<0) rotate clockwise. [default w=0]

% stop robot
tbot.stop();

% rotate robot by an angle (add angle to current orientation)
tbot.rotate(angle);

% read 2D pose location (x,y) and orientation (theta)
[x, y, theta, timestamp] = tbot.readPose();

% define/overwrite pose of robot (place robot in map)
tbot.setPose(x, y, theta);

% reset pose: (x,y,theta) = (0,0,0)
tbot.resetPose();

% detect obstacles (in front of the robot) at a given range and aperture
[detectionFlag, settings] = tbot.naiveObstacleDetection(range = 0.4, aperture = pi/8);

% display robot at pose (x,y,theta)
drawTurtleBot(x, y, theta);

% display obstacle detection (detectionFlag) at pose (x,y,theta)
drawObstacleSensor(x, y, theta, detectionFlag, settings);

% Shutdown ROS Connection
clear tbot;
```

