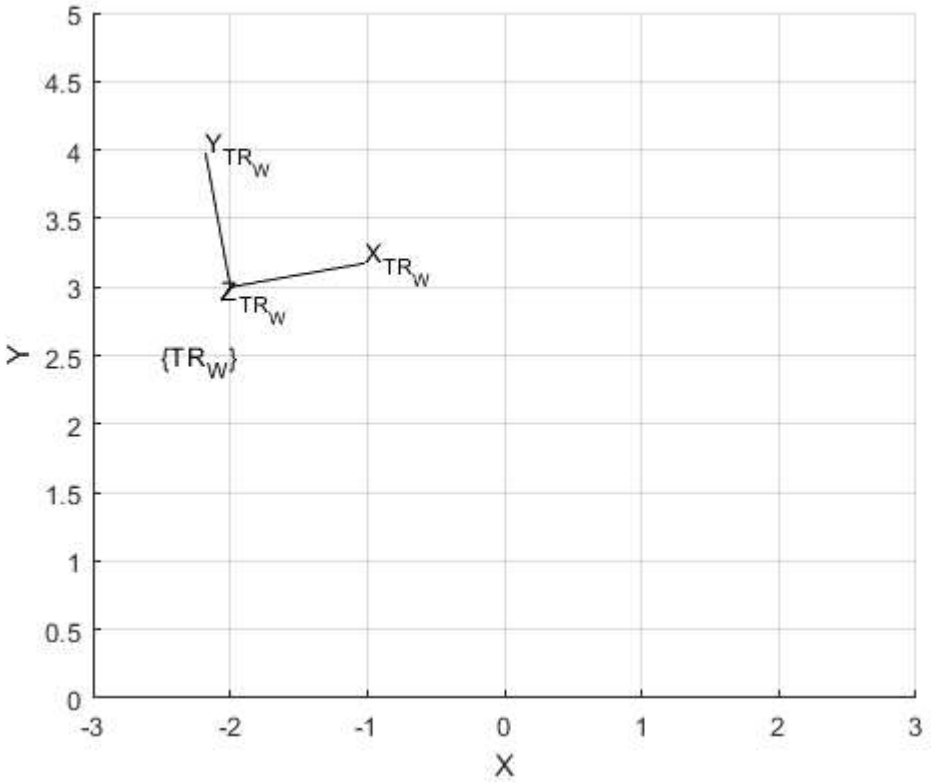
Contents

Pose of robot w.r.t world

```
TR_W = transl(-2,3,5)*trotz(10, "deg")*troty(-5, "deg")*trotx(5, "deg")
trplot(TR_W, 'frame', 'TR_W', "color", "k","axis", [-3,3,0,5,0,8])
hold on
```

```
TR_W =

    0.9811   -0.1805   -0.0704   -2.0000
    0.1730    0.9797   -0.1009    3.0000
    0.0872    0.0868    0.9924    5.0000
         0         0         0    1.0000
```



Pose of the Sensor w.r.t robot

```
TS_R = transl(0,0,1)
% Pose of the Sensor w.r.t world
```

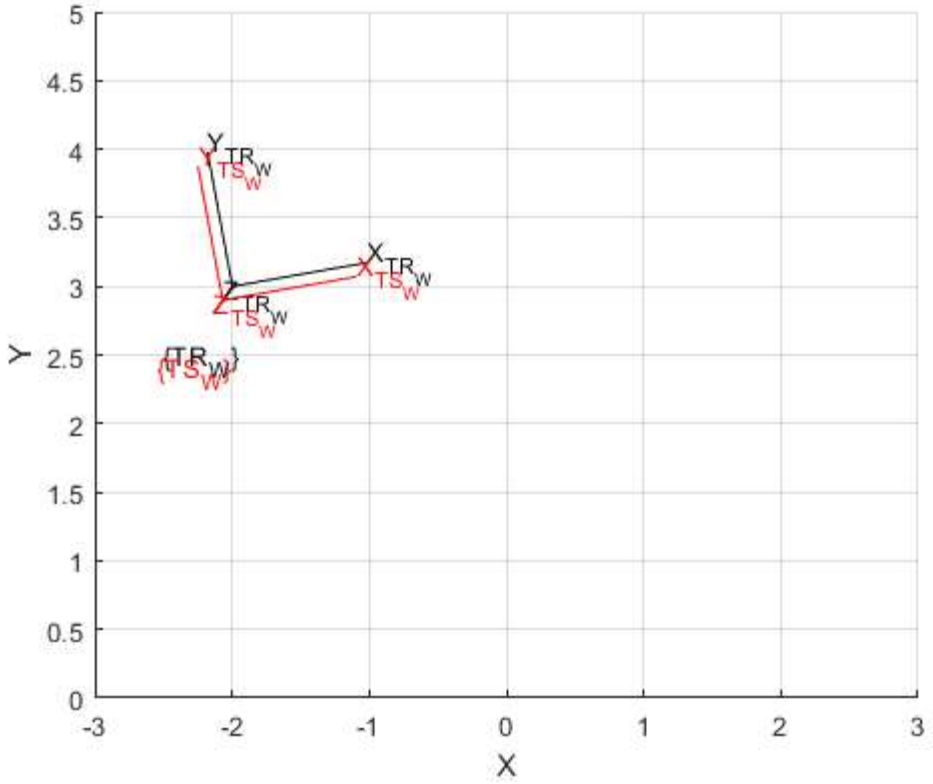
```
TS_W = TR_W*TS_R
trplot(TS_W, 'frame', 'TS_W', "color", "r")
```

```
TS_R =

     1     0     0     0
     0     1     0     0
     0     0     1     1
     0     0     0     1


TS_W =

    0.9811   -0.1805   -0.0704   -2.0704
    0.1730    0.9797   -0.1009    2.8991
    0.0872    0.0868    0.9924    5.9924
         0         0         0    1.0000
```



Pose of the object w.r.t world

```
TS_O = [0.1730, -0.9811, 0.0872, 2.2486;
    0.9797, 0.1805, 0.0868, -2.8482;
    -0.1009, 0.0704, 0.9924, -4.9789;
    0, 0, 0, 1]
TO_W = TS_W*TS_O
trplot(TO_W, 'frame', 'TO_W', "color", "g")
```

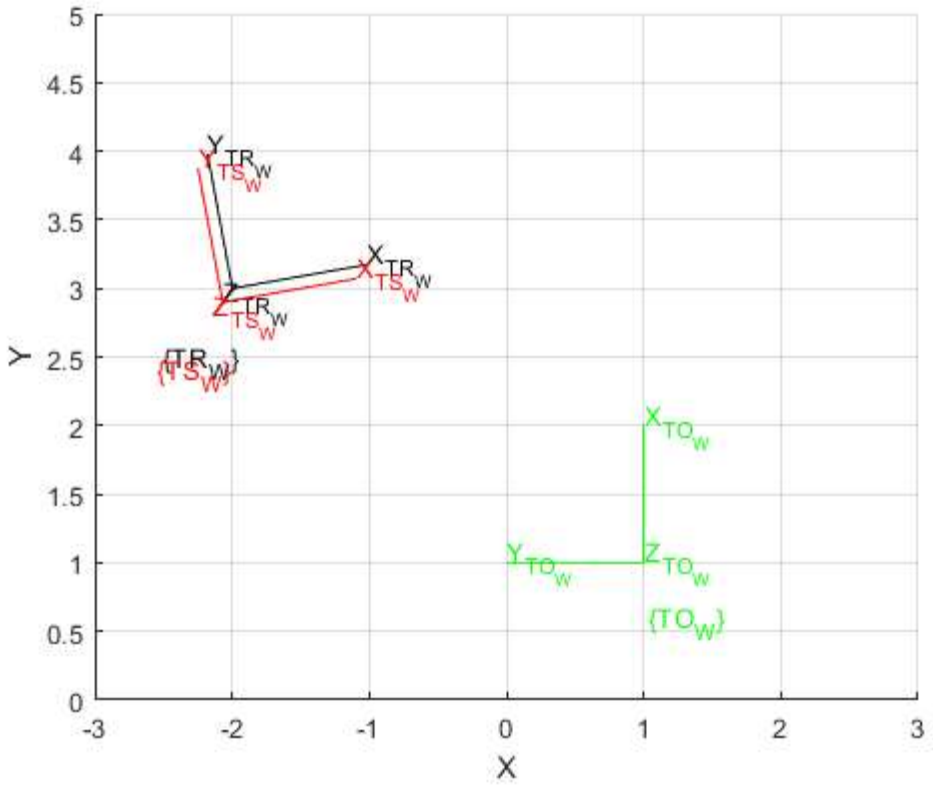
```
TS_O =

    0.1730   -0.9811    0.0872    2.2486
    0.9797    0.1805    0.0868   -2.8482
   -0.1009    0.0704    0.9924   -4.9789
         0         0         0    1.0000


TO_W =

    0.0000   -1.0000    0.0000    1.0000
    1.0000    0.0000   -0.0000    1.0000
    0.0000    0.0000    1.0000    1.0000
         0         0         0    1.0000

Warning: The new value for the Matrix property may cause rendering problems.
```



angles

```
tr2rpy(TO_W,"deg")
```

```
ans =

    0.0016   -0.0003   89.9989
```

proof that the Rotations component is valid

```
det(t2r(TO_W))
```

```
ans =

    1.0000
```

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