ISEN | école d'ingénieurs
ALL IS DIGITAL!

Class 6

Santiago BRAGAGNOLO

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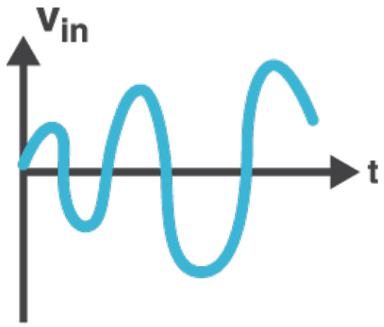
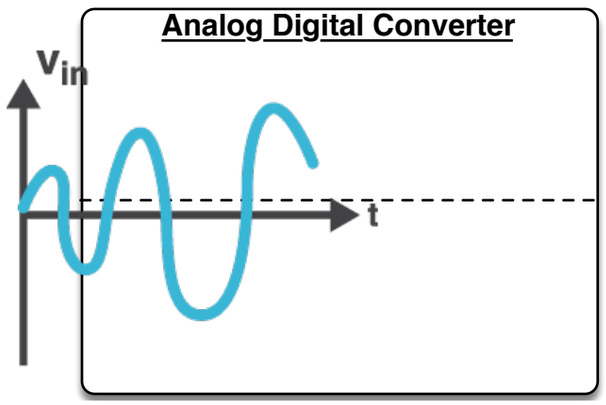
ALL IS DIGITAL!

On ROS bases

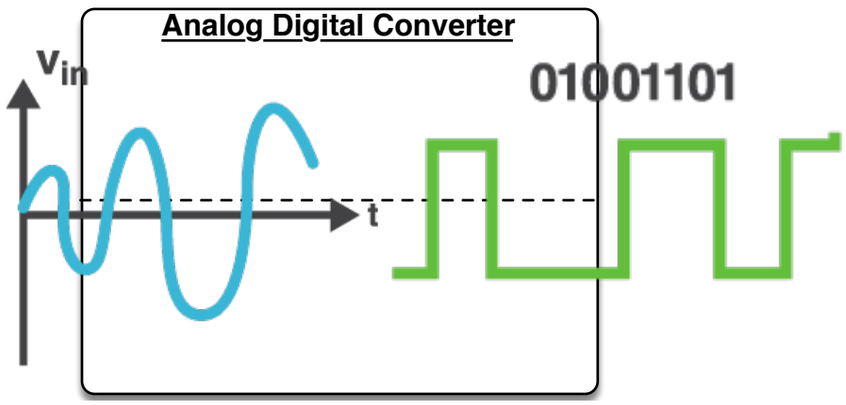
Sensors



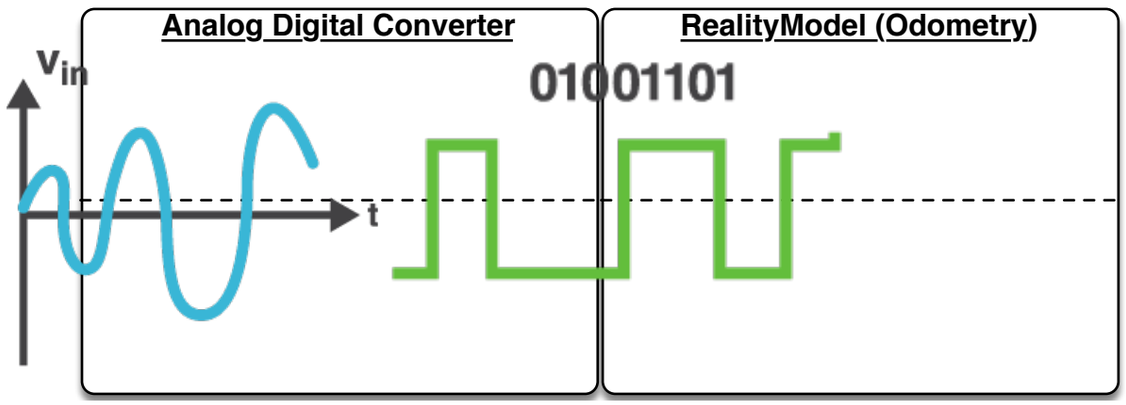
Sensors



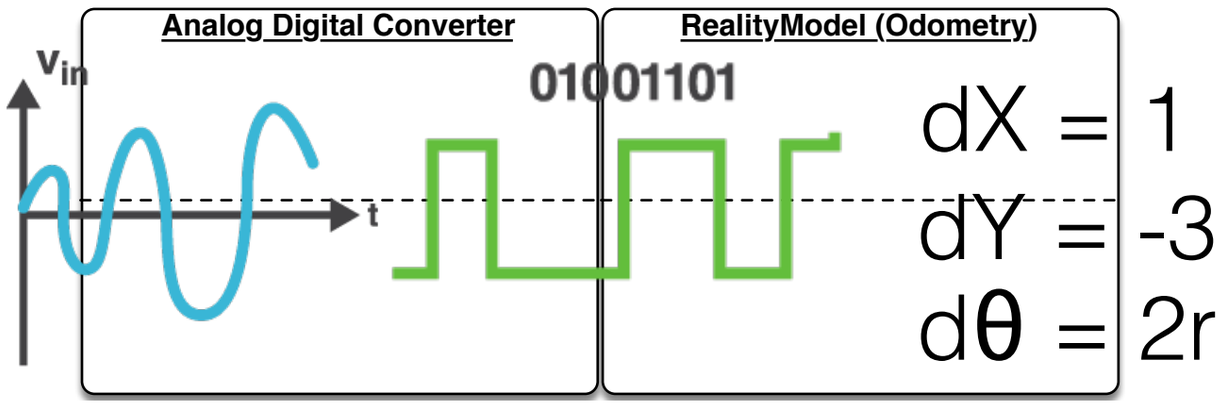
Sensors



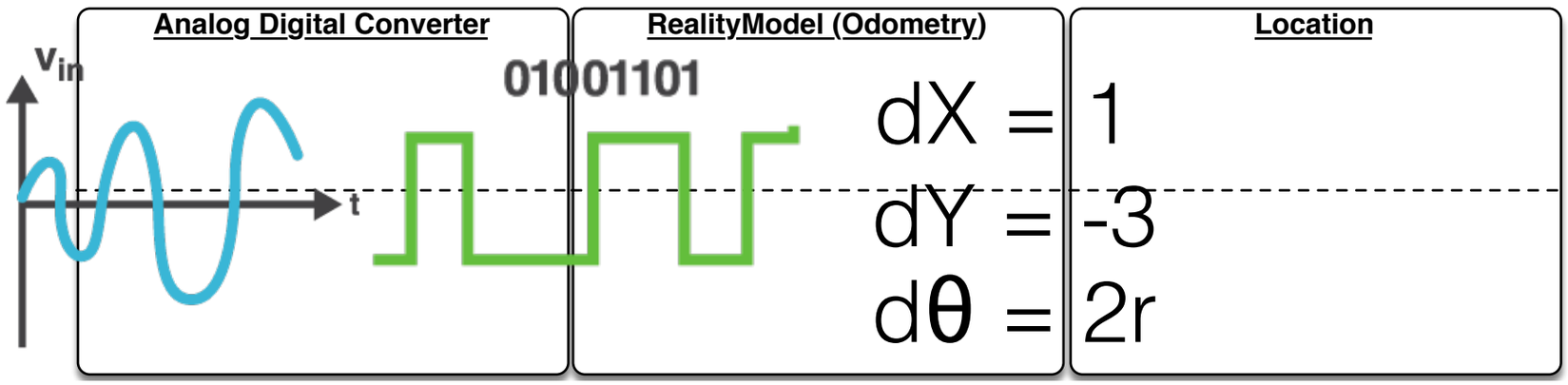
Sensors


Analog Digital Converter
RealityModel (Odometry)
V_{in}
01001101
t

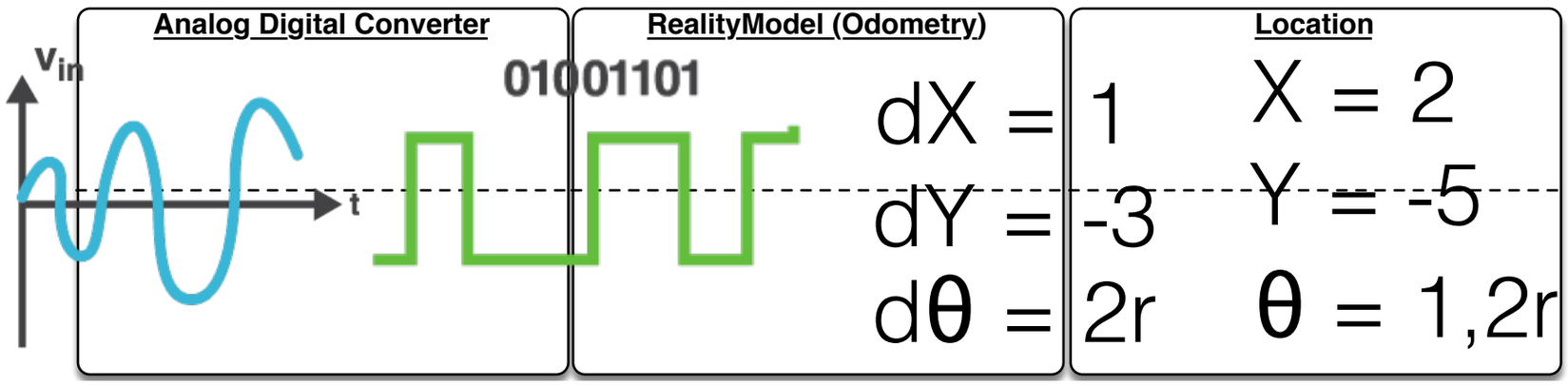
Sensors


Analog Digital Converter
RealityModel (Odometry)
v_{in}
t
01001101
dX = 1
dY = -3
dθ = 2r

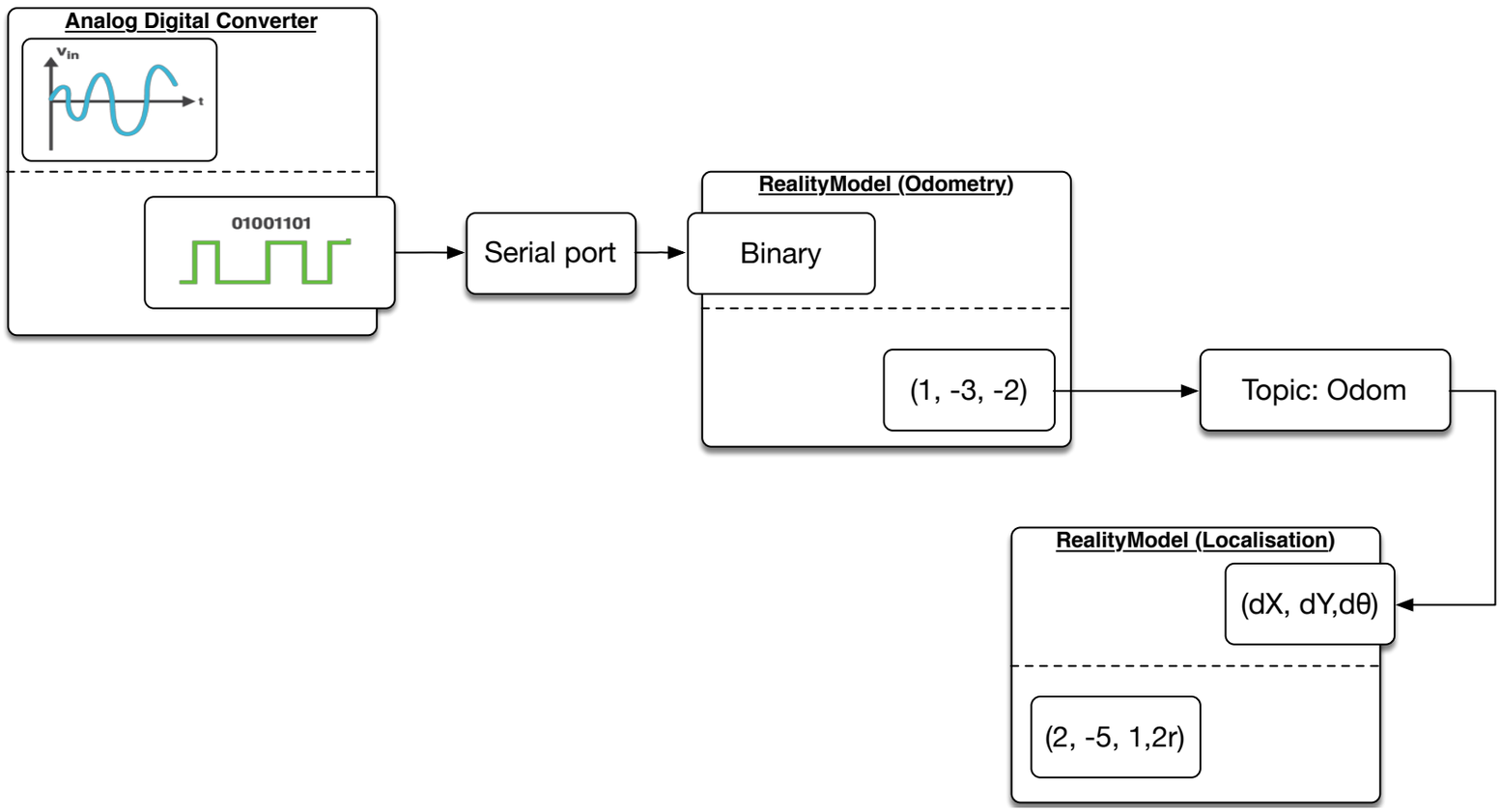
Sensors


Analog Digital Converter
RealityModel (Odometry)
Location
v_{in}
t
01001101
dX = 1
dY = -3
dθ = 2r

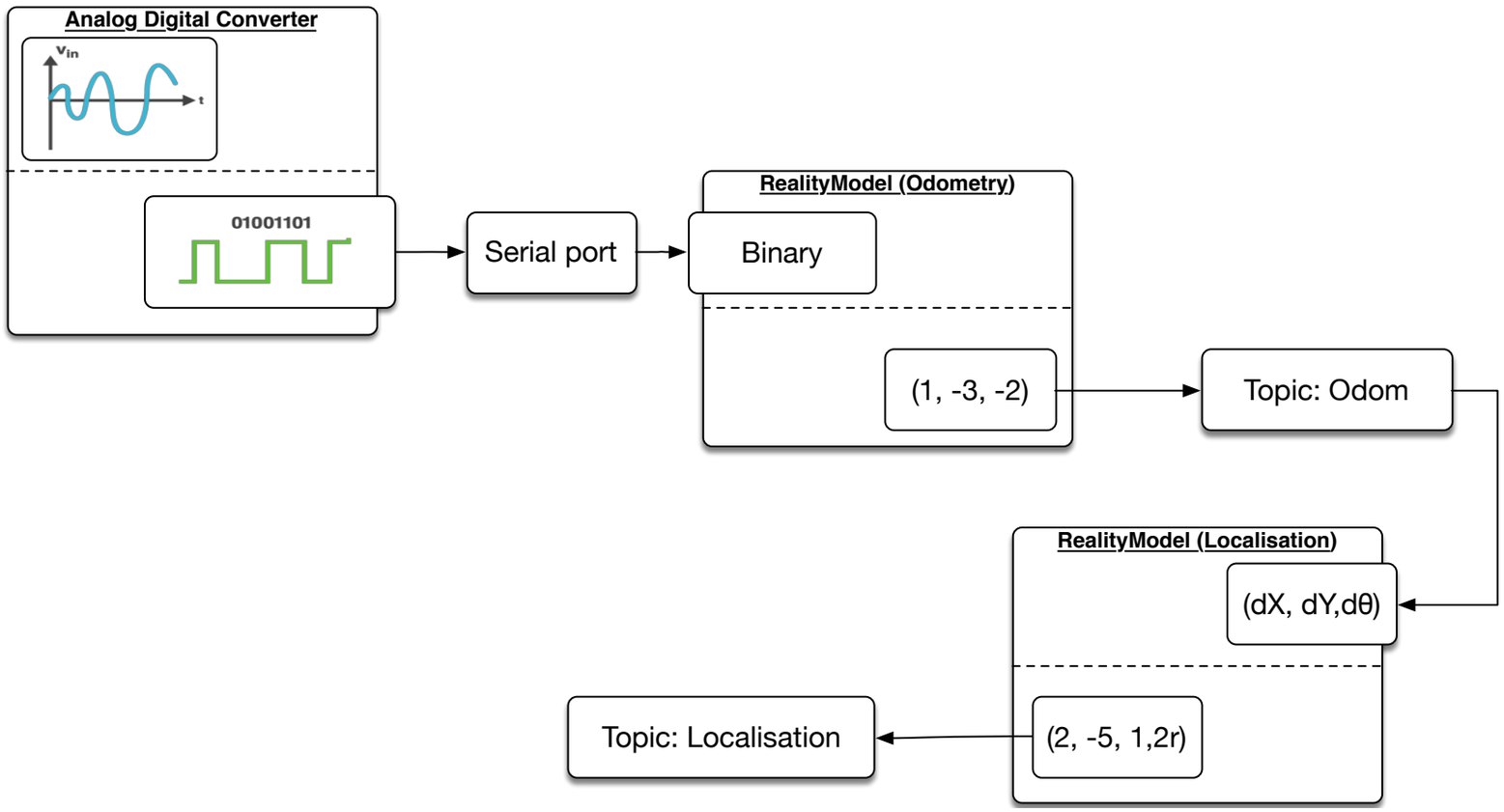
Sensors


Analog Digital Converter
RealityModel (Odometry)
Location
V_{in}
t
01001101
dX = 1
dY = -3
dθ = 2r
X = 2
Y = -5
θ = 1,2r

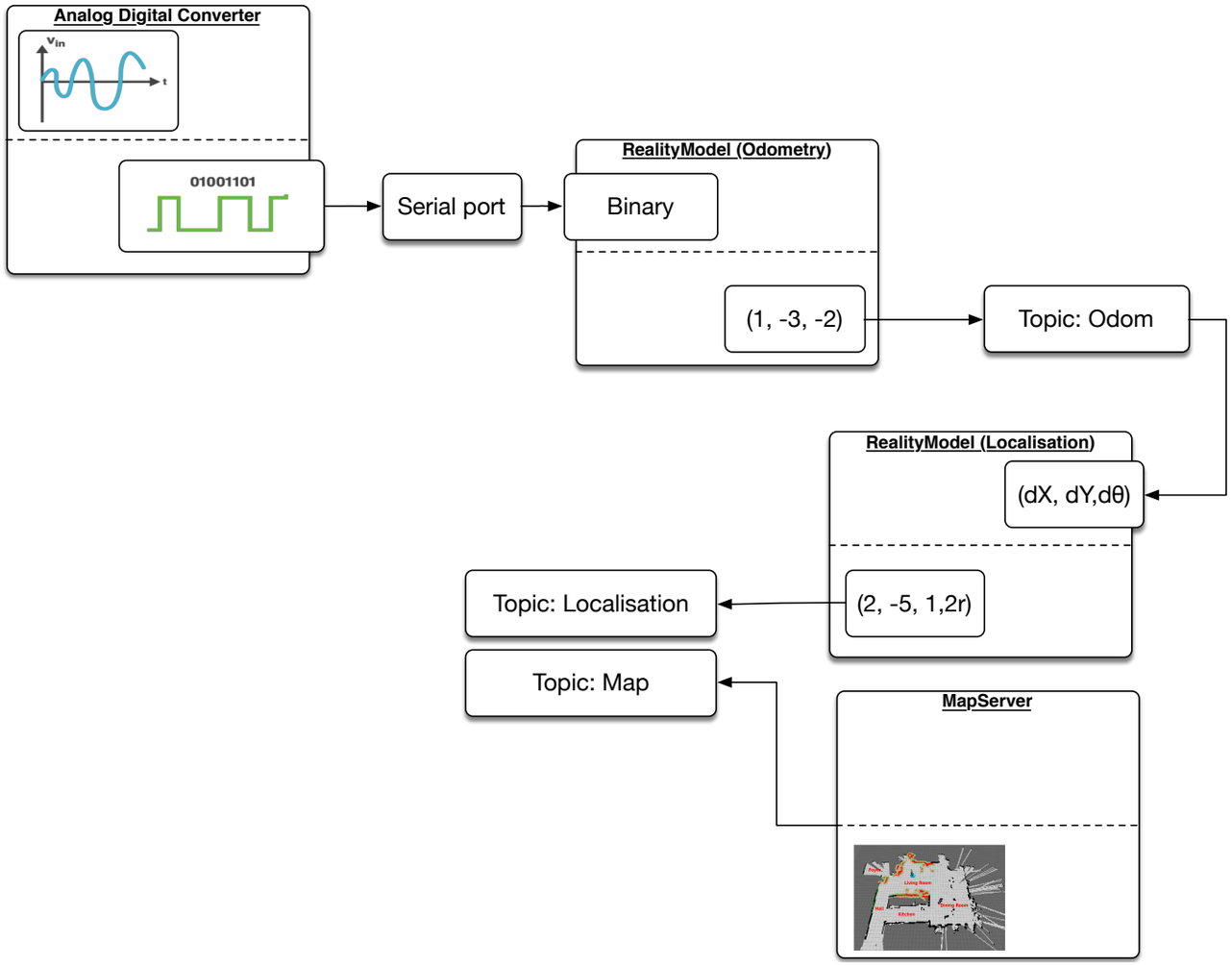
Sensors


Analog Digital Converter
V_{in}
t
01001101
Serial port
RealityModel (Odometry)
Binary
(1, -3, -2)
Topic: Odom
RealityModel (Localisation)
(dX, dY,dθ)
(2, -5, 1,2r)

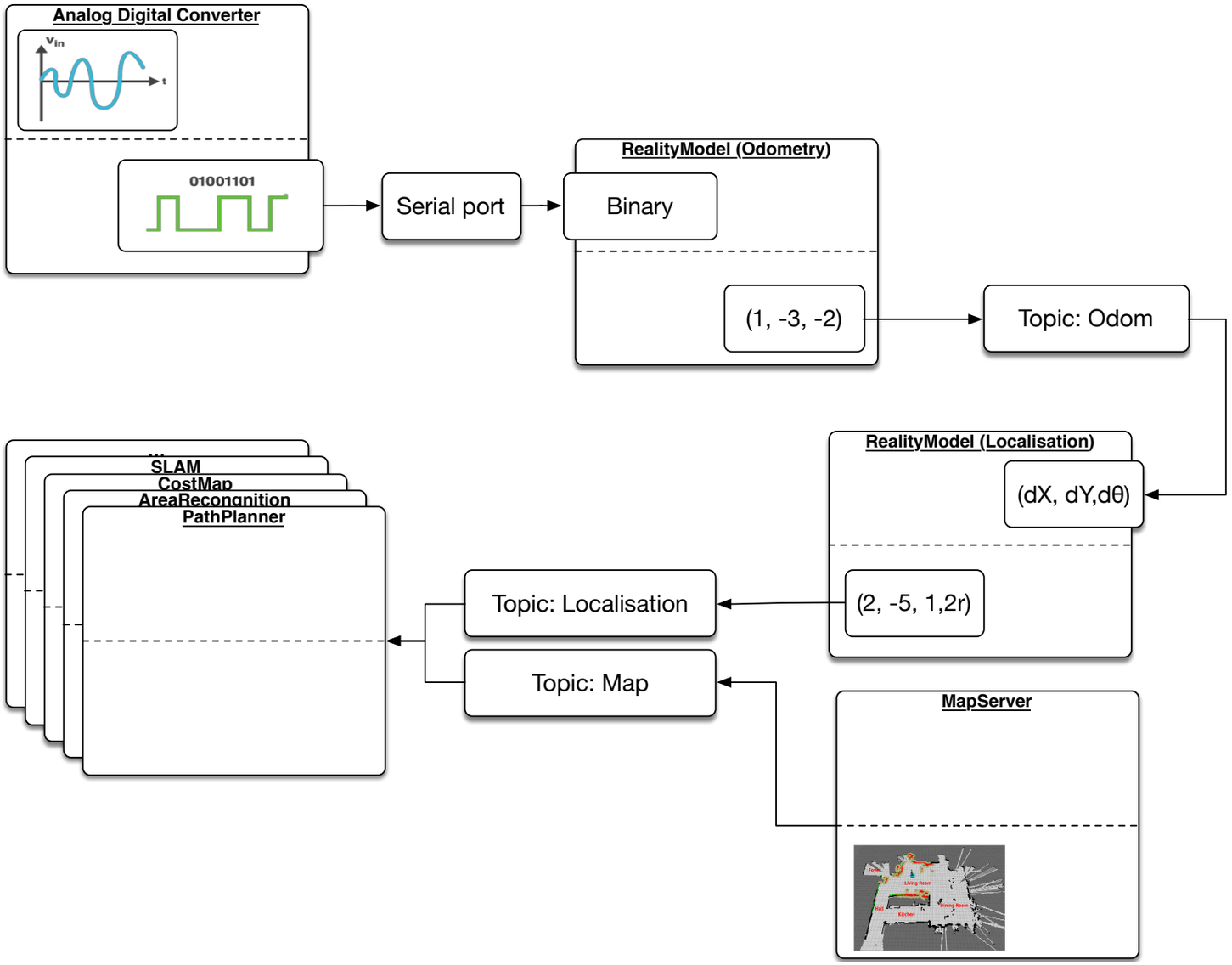
Sensors


Analog Digital Converter
v_{in}
t
01001101
Serial port
RealityModel (Odometry)
Binary
(1, -3, -2)
Topic: Odom
RealityModel (Localisation)
(dX, dY,dθ)
(2, -5, 1,2r)
Topic: Localisation

Sensors

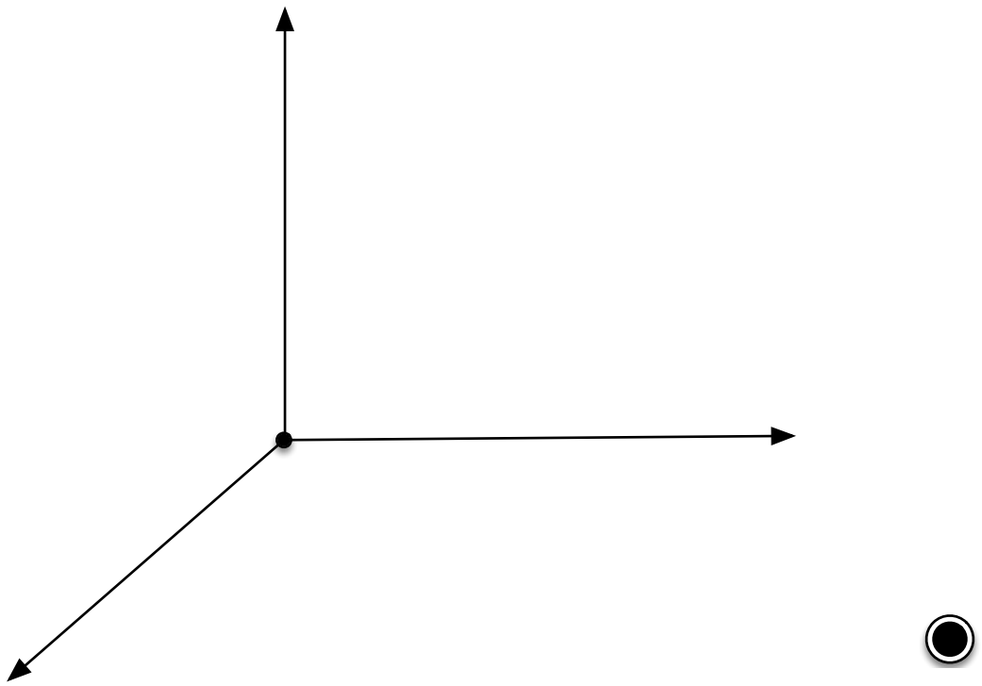

Analog Digital Converter
V_{in}
t
01001101
Serial port
RealityModel (Odometry)
Binary
(1, -3, -2)
Topic: Odom
RealityModel (Localisation)
(dX, dY,dθ)
(2, -5, 1,2r)
Topic: Localisation
Topic: Map
MapServer

Sensors

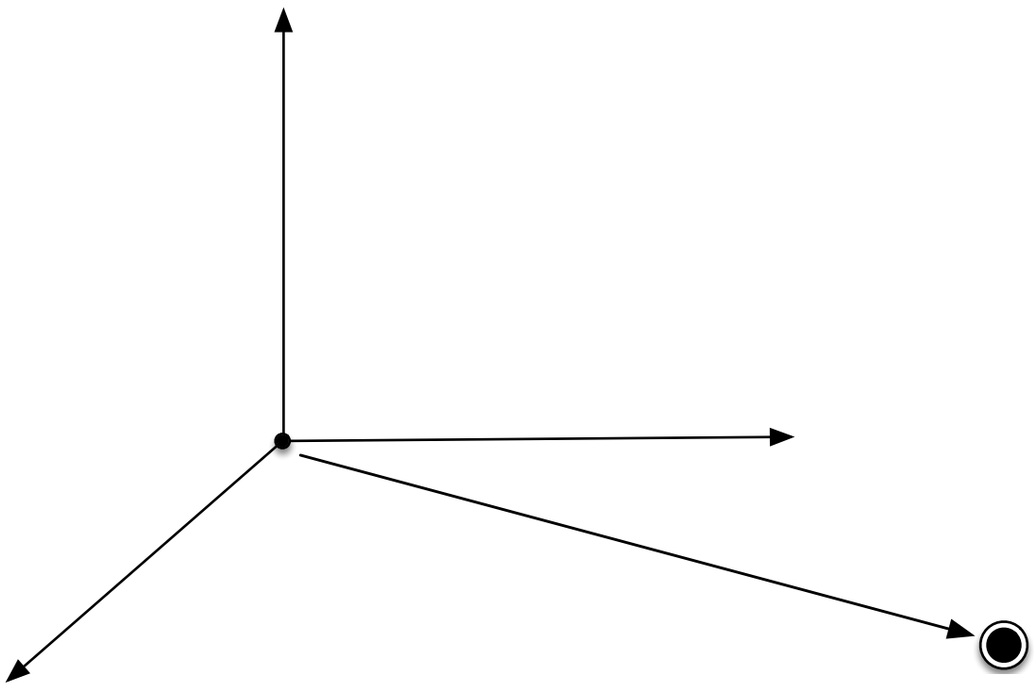

Analog Digital Converter
V_{in}
t
01001101
Serial port
RealityModel (Odometry)
Binary
(1, -3, -2)
Topic: Odom
RealityModel (Localisation)
(dX, dY,dθ)
(2, -5, 1,2r)
Topic: Localisation
Topic: Map
SLAM
CostMap
AreaRecognition
PathPlanner
MapServer

Robot Geometric representation

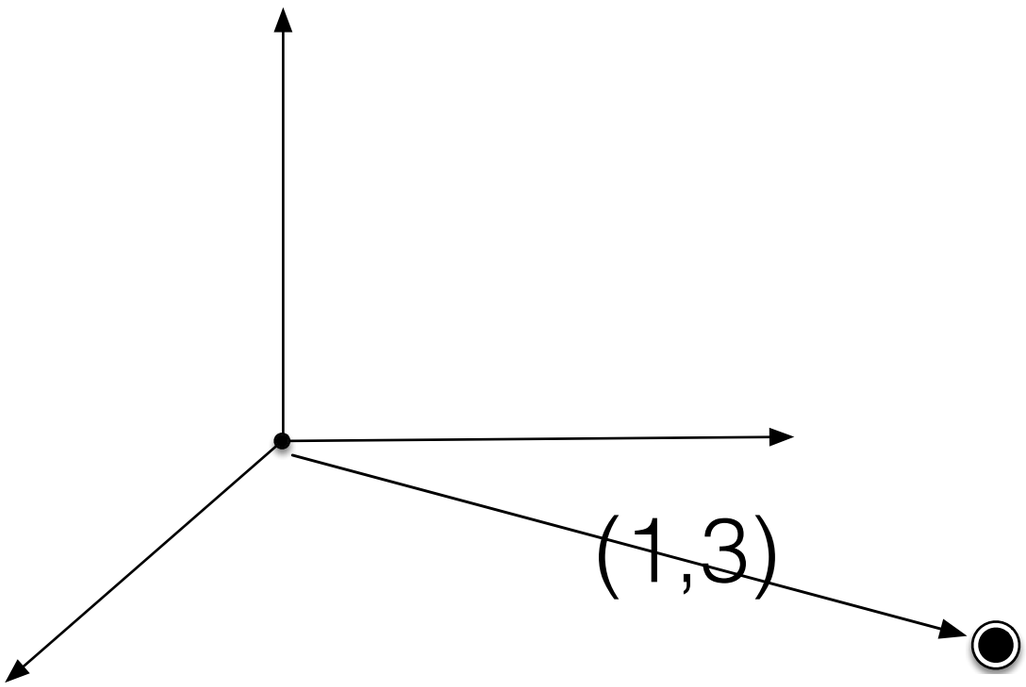
Robot Geometric representation



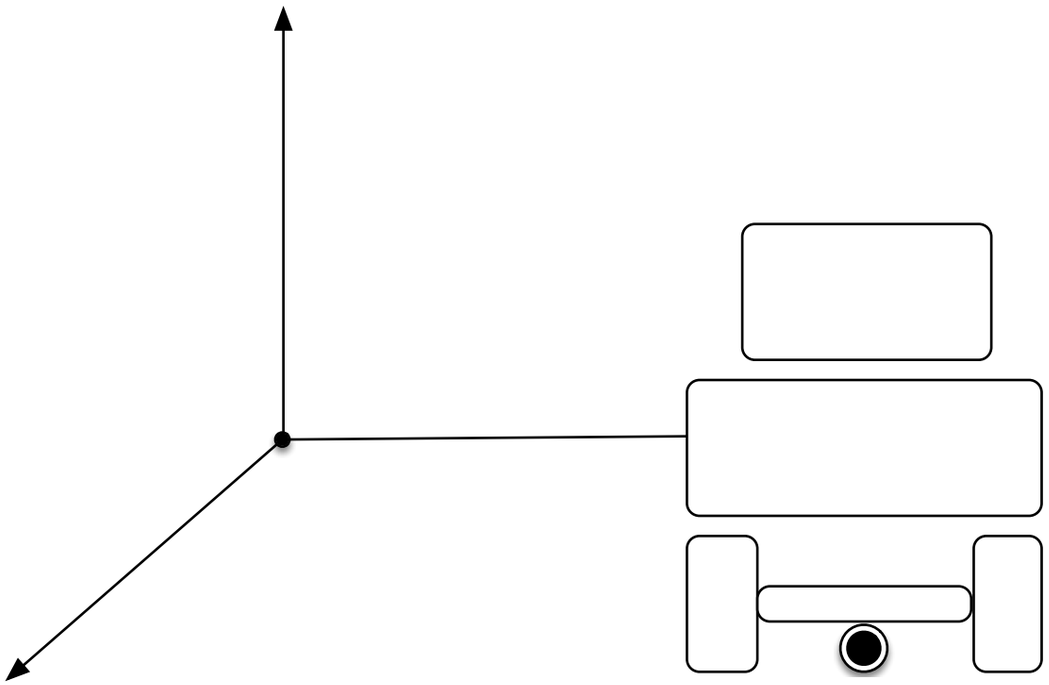
Robot Geometric representation



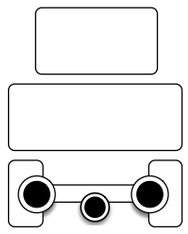
Robot Geometric representation



Robot Geometric representation

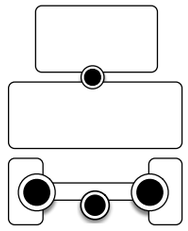


Robot Geometric representation



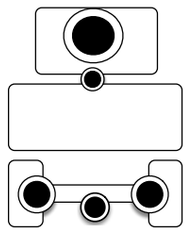
- Odometer (Right and Left)

Robot Geometric representation



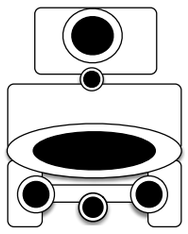
- Odometer (Right and Left)
- Accelerometer

Robot Geometric representation



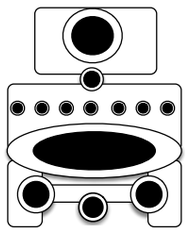
- Odometer (Right and Left)
- Accelerometer
- Lidar

Robot Geometric representation



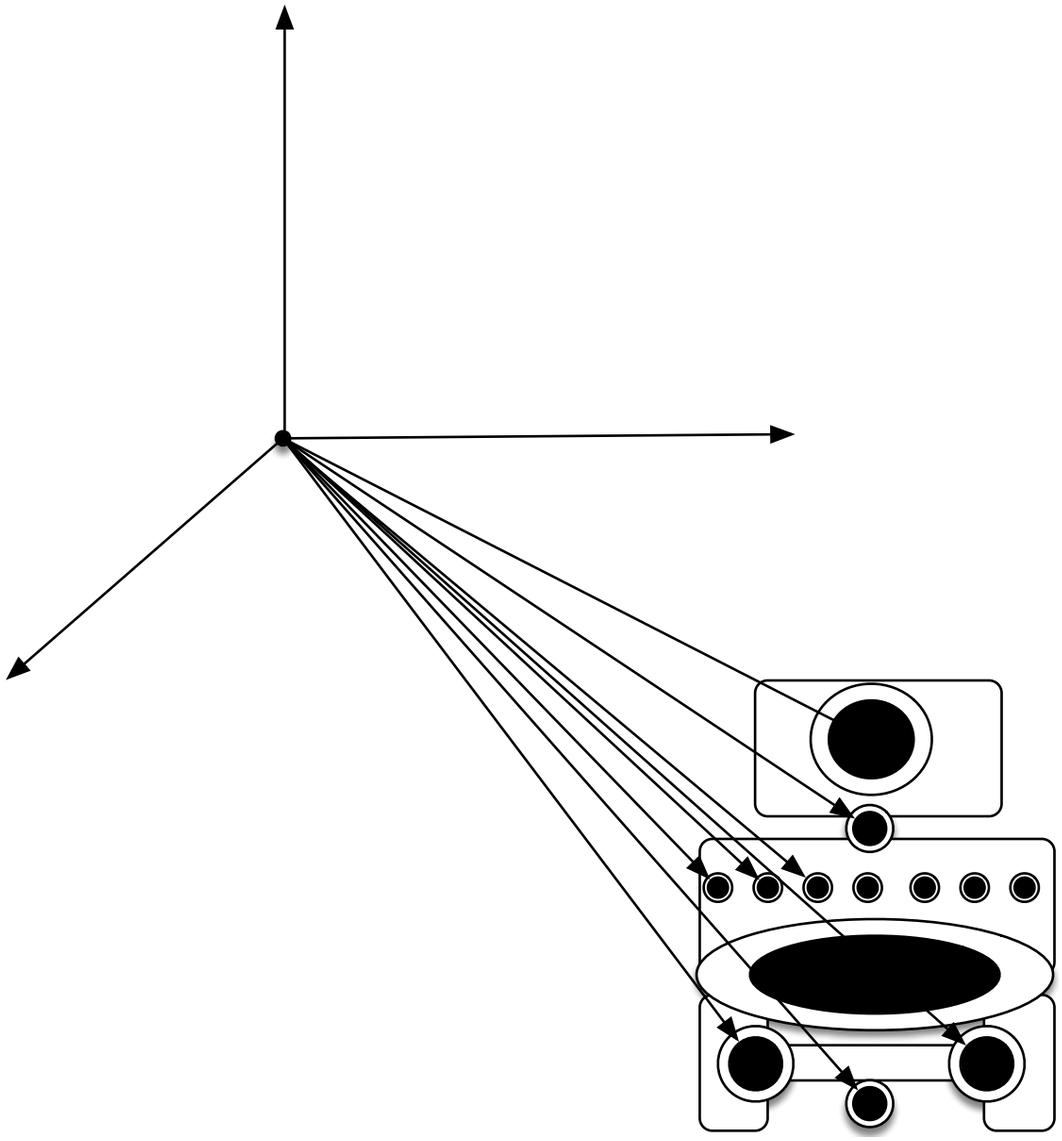
- Odometer (Right and Left)
- Accelerometer
- Lidar
- Bumper

On ROS bases

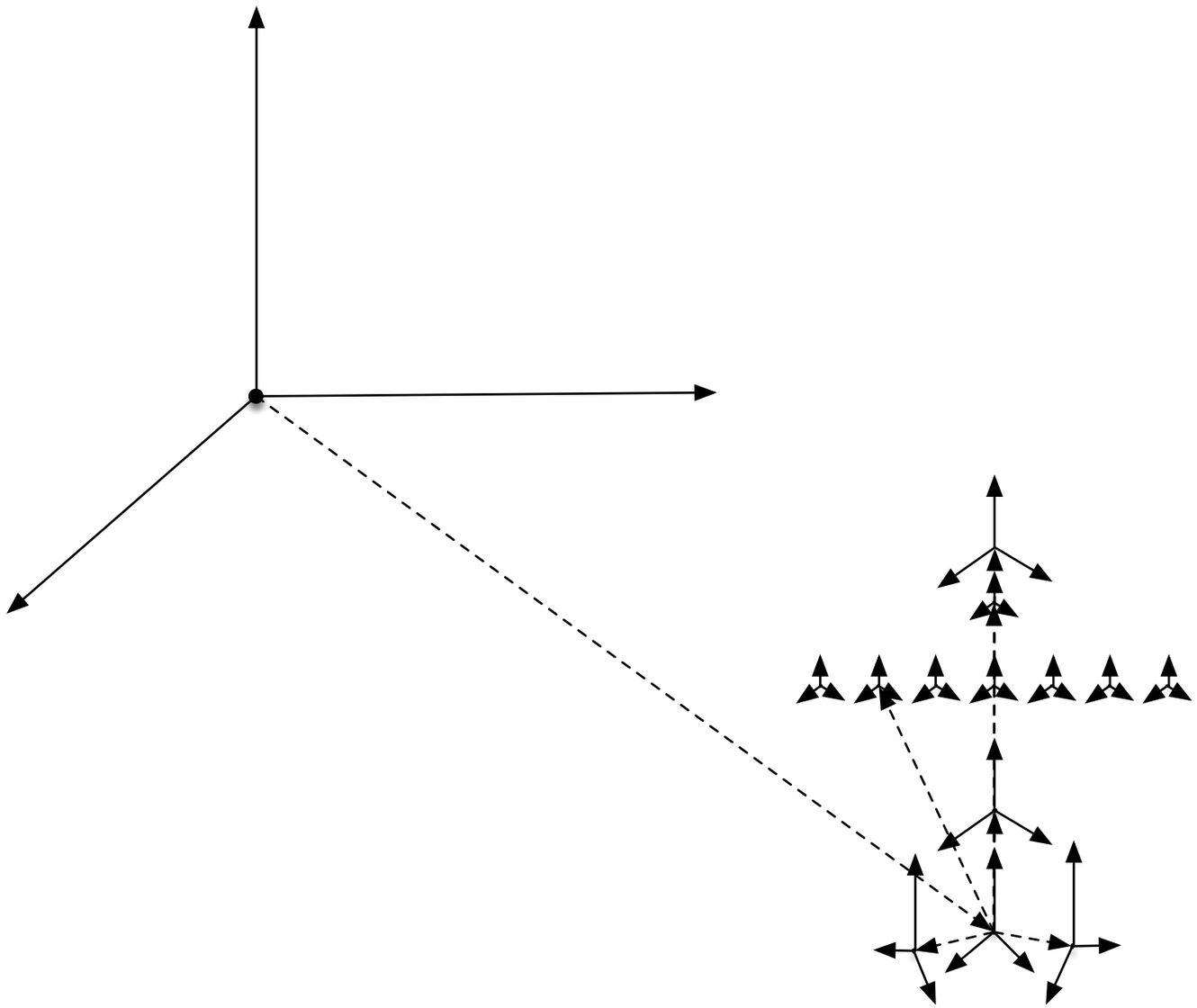


- Odometer (Right and Left)
- Accelerometer
- Lidar
- Bumper
- Sonar, etc

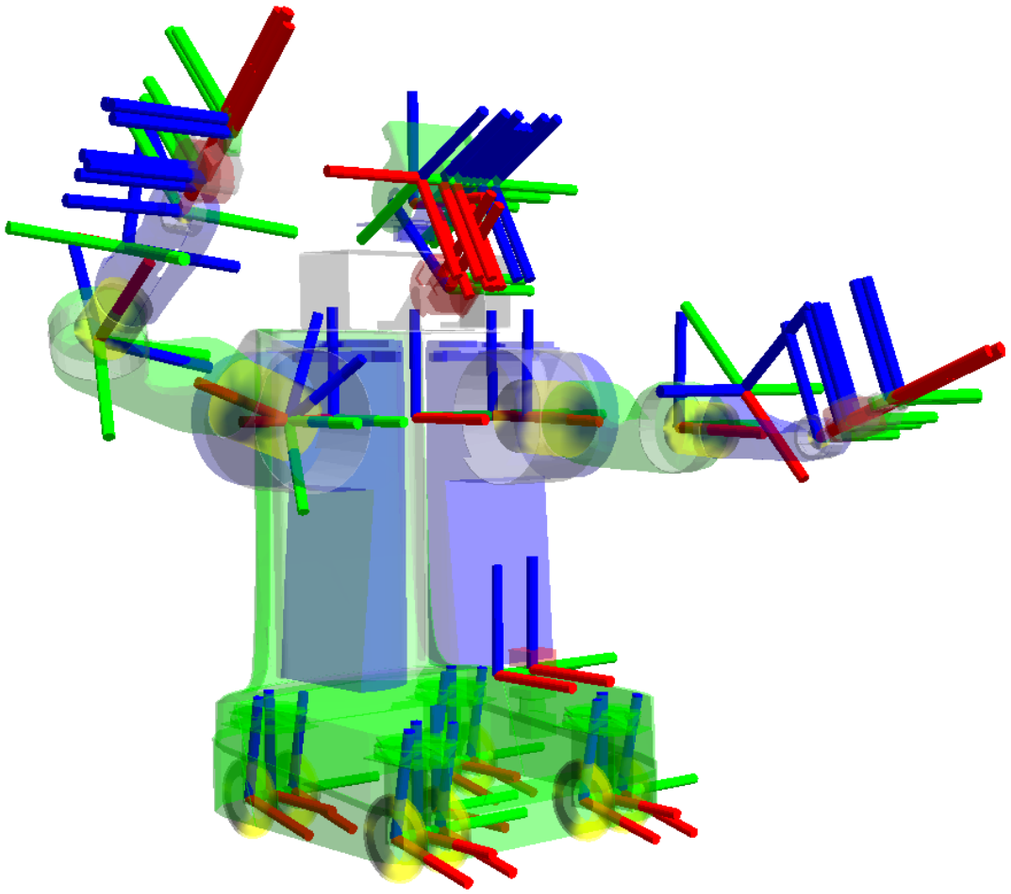
Robot Geometric representation



Robot Geometric representation



Robot Geometric representation



Robot Geometric representation

- Transformation Tree
- Expressed in terms of frames
- Relative positions

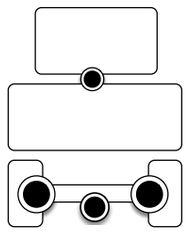
Robot Geometric representation

```
static_transform_publisher
                    x y z
                    yaw pitch roll
                    frame_id child_frame_id
                    period_in_ms
```

Robot Geometric representation

Define a static representation by using this command for representing the given robot definition

static_transform_publisher
x y z
yaw pitch roll
frame_id child_frame_id
period_in_ms



Robot Geometric representation

```
$ rosrun tf view_frames
```

```
$ rosrun tf tf_echo /map /odom
At time 1263248513.809
- Translation: [2.398, 6.783, 0.000]
- Rotation: in Quaternion [0.000, 0.000, -0.707, 0.707]
in RPY [0.000, -0.000, -1.570]
```

```
$ rostopic echo /tf
```

```
$ rostopic hz /tf
```