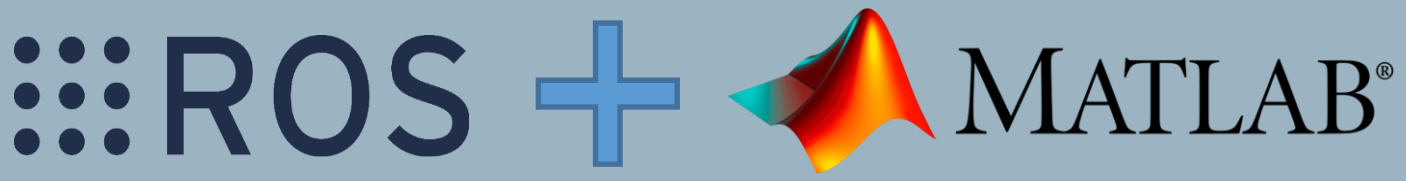
POLITECNICO DI MILANO

AUTONOMOUS VEHICLES

S. Arrigoni

How to use BAGS



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How to use BAGS in MATLAB/ Simulink

```
bagselect = rosbag('ex_multiple_topics.bag');
```

Create MATLAB object

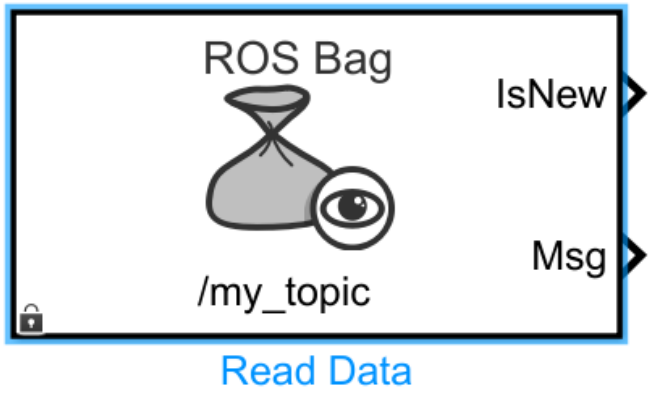
```
%Select a subset of the messages, filtered by time and topic.
bagselect2 = select(bagselect,'Time',...
[bagselect.StartTime bagselect.StartTime + 1],'Topic','/odom');
```

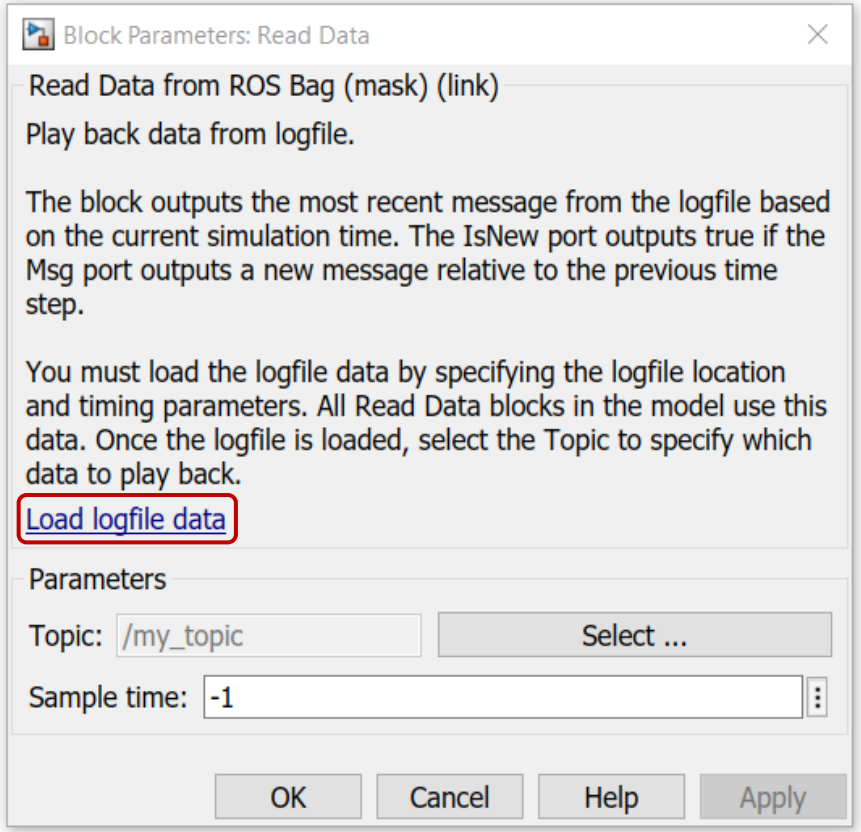
Possibility to select a subset

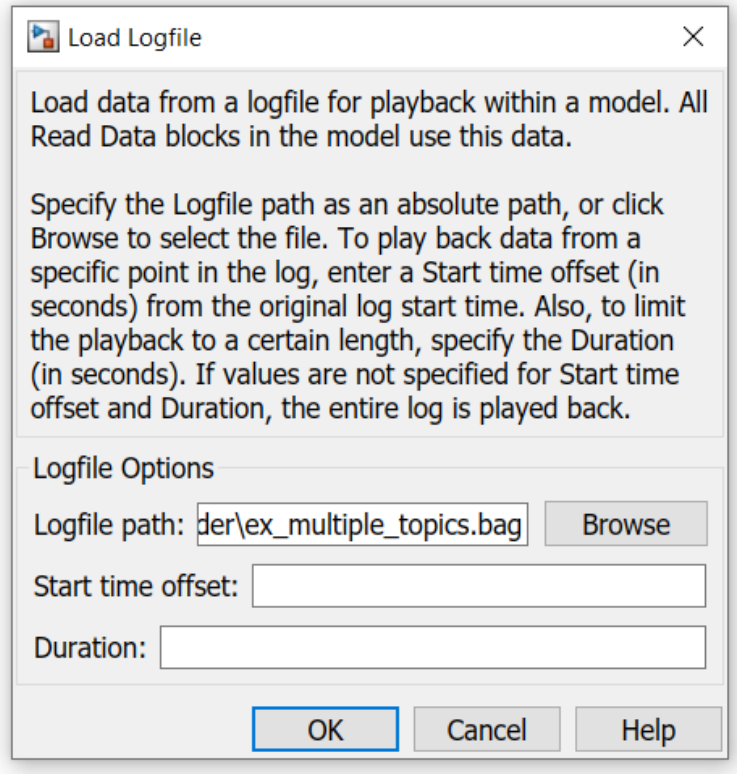
```
% Read messages as a structure. Specify the DataFormat name-value pair
% when reading the messages. Inspect the first structure in the returned
% cell array of structures.
msgStructs = readMessages(bagselect2,'DataFormat','struct');
msgStructs{1}
```

Create a cell array of data

How to use BAGS in MATLAB/ Simulink







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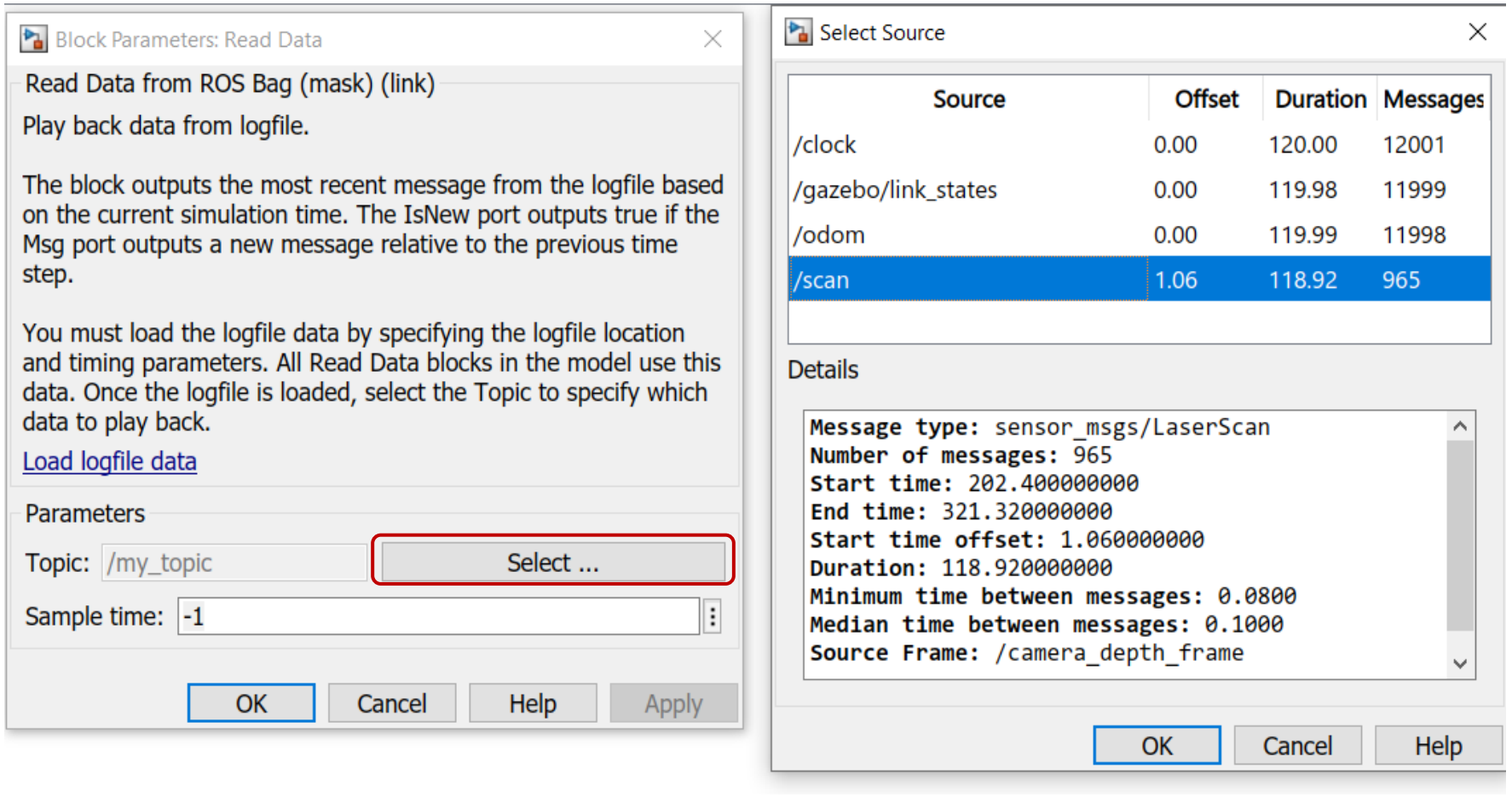

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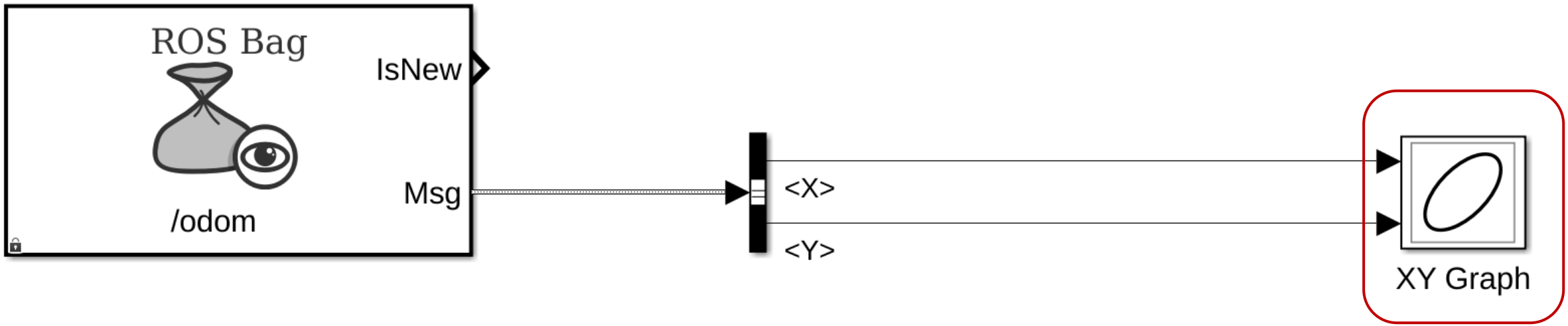
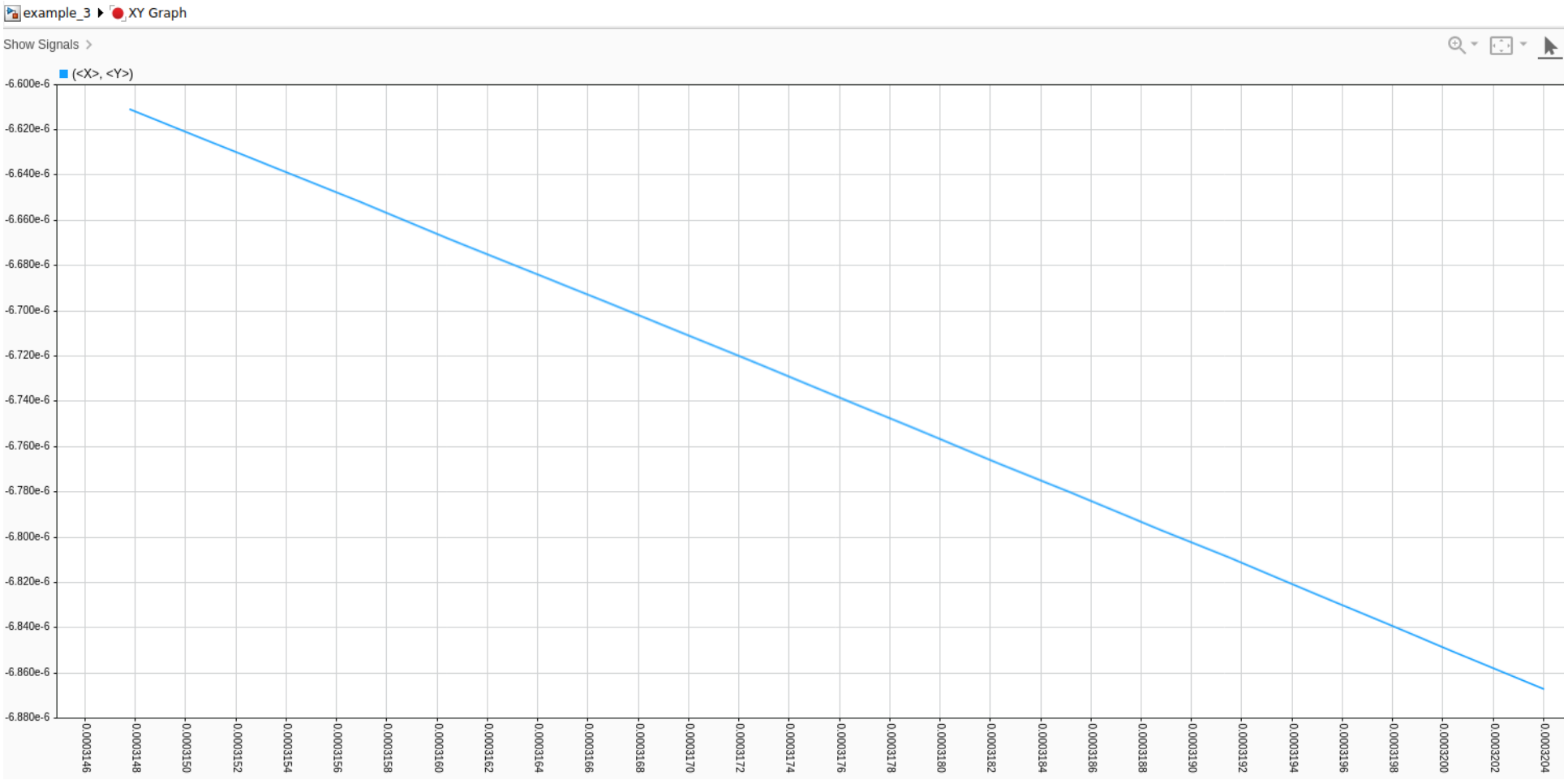
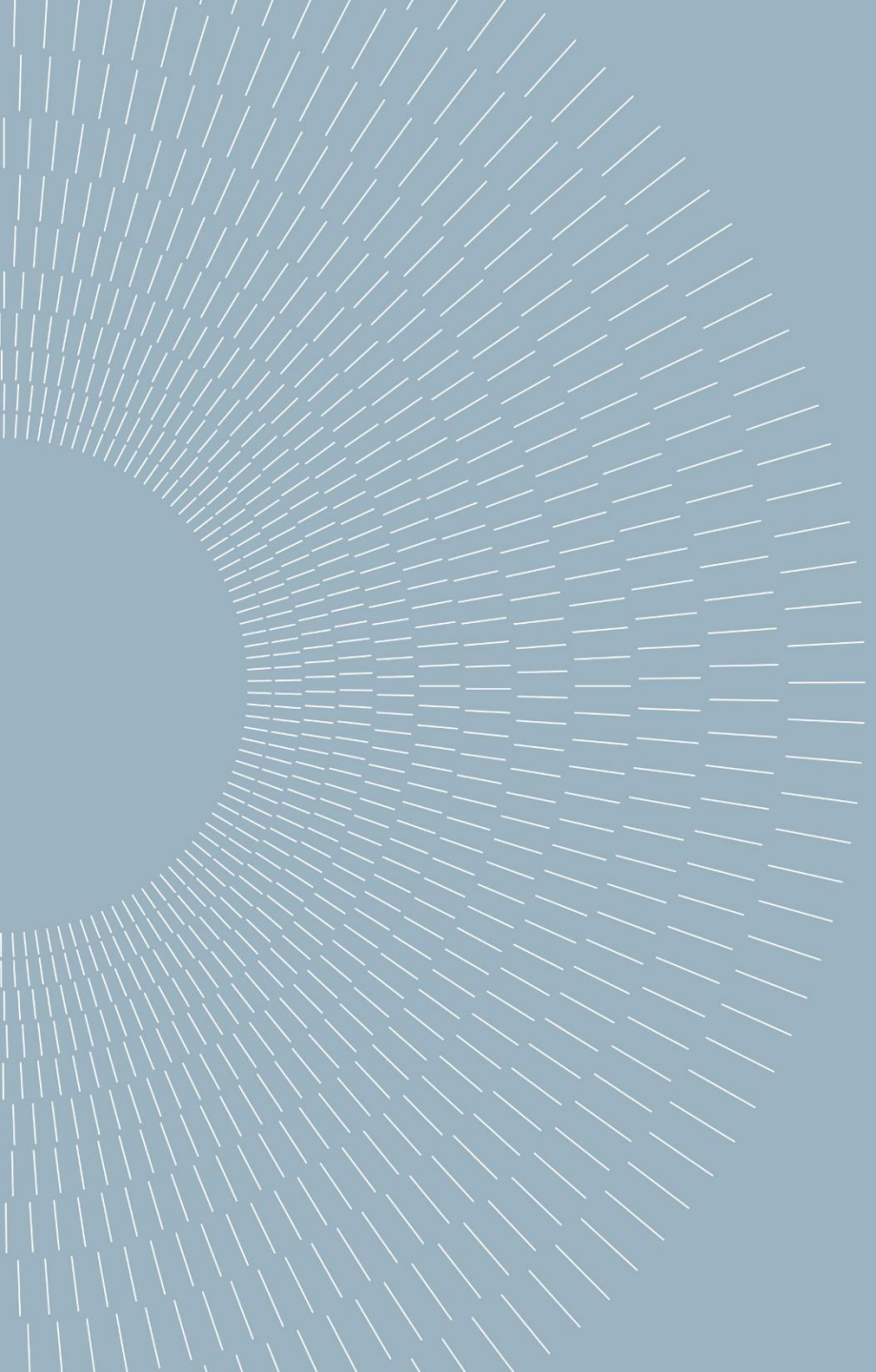


How to use BAGS in MATLAB/ Simulink





ROS

Assignment I -A

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What we expect from you

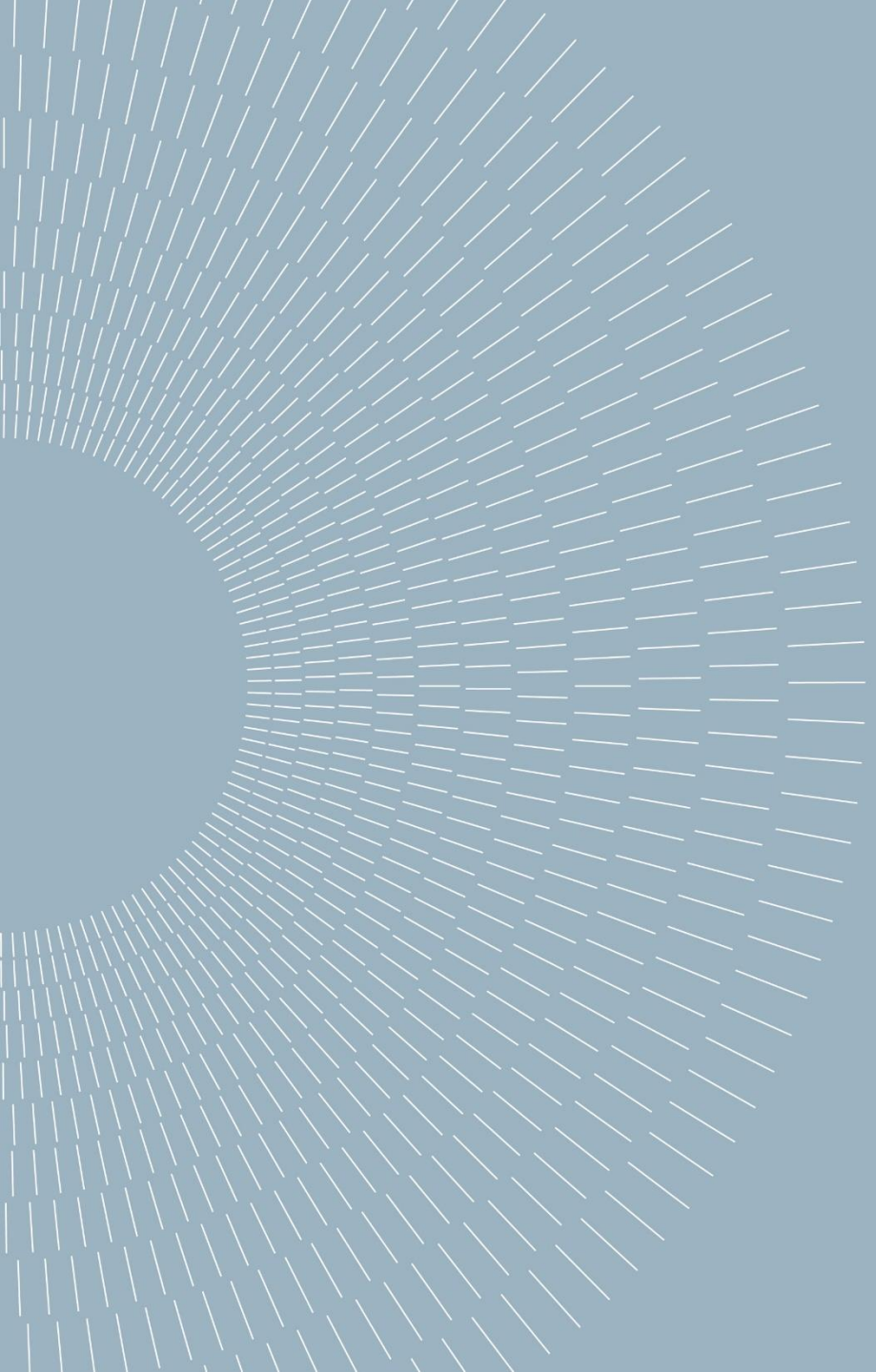
Starting from a Bag file provided (*ex_A1.bag*),
evaluate at each time:

- minimum distance respect to obstacles
- An estimate of /cmd_vel sequence provided to the robot

List of suggested steps

HINT: this part of the assignment can be done using just MATLAB (windows)

- Subscribe to bag messages
- Evaluate minimum distance (and save it)
- Evaluate /cmd_vel in consecutive time steps (odom?) and save it
- Write a publisher with that sequence (and save a bag)
- Use matlab to plot results for the report



ROS

Assignment I -B

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What we expect from you

Starting from a your cmd_vel estimated:

- Evaluate how accurate it is

List of suggested steps

HINT: this part of the assignment requires the use of Gazebo + ROS

- Run *estimated commands* (a bag prev saved? Simulink or directly ROS?)
- Save robot behavior with your *estimated commands*
- Compare the original and reproduced robot behavior and provide a proof for the report

That’s it for today…

See you next time!

S. Arrigoni