

The beginning steps of SUMO TraCI programming with MATLAB script

1. Unpack the example folder containing:
 - SUMO files,
 - +traci folder,
 - TraCI jar file (traci4matlab.jar), and
 - MATLAB script file.

The +traci folder consists of 15 SUMO object folders (e.g. +vehicle, +route). Each folder contains the “get” and “set” functions in connection with the object.

The general structure to “get” or “set” is the following:

```
traci.<domain>.<get/set_wrapper()>
```

where the domain is the name of the object, and get/set_wrapper() are the methods for accessing the values (get) or modifying (set) the attributes of the object of interest.

An example for accessing the current speed of a vehicle with the ID '1.0' is the following:

```
traci.vehicle.getSpeed('1.0')
```

2. Start MATLAB and navigate to the folder defined above.
3. Open the **roundabout.m** script file, and the following simple TraCI program will appear:

```
clear all  
close all
```

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```

format compact %smaller line spacing in Command Window
clc %clears the Command Window

javaaddpath('traci4matlab.jar')

%% Main
projectPath = [pwd filesep 'roundabout.sumocfg'];

try
system(['sumo-gui' ' -c ' projectPath ' --remote-port 8813' ' --step-length
0.1' ' --start &']);
catch err
end

%initialization
[traciVersion,sumoVersion] = traci.init()

%sets the visualization scheme
traci.gui.setSchema('View #0', 'real world');

while i < 3600*10 %10 simulation steps (car following model) per second
%this runs one simulation step
traci.simulationStep();
%this is not necessary, only slows the simulation down for better display
pause(0.5)

%gets vehicle IDs
vehicles= traci.vehicle.getIDList();

%sets how the values set by setSpeed() and slowDown() shall be treated
for ii=1:length(vehicles)
traci.vehicle.setSpeedMode(cell2mat(vehicles(ii)),0);
traci.vehicle.setSpeed(cell2mat(vehicles(ii)),55);
%get actual speed, CO2 emission, distance travelled and edge ID of cars
disp(['Speed ', cell2mat(vehicles(ii)), ': ',
num2str(traci.vehicle.getSpeed(cell2mat(vehicles(ii)))) ' m/s']);
disp(['CO2Emission ', cell2mat(vehicles(ii)), ': ',
num2str(traci.vehicle.getCO2Emission(cell2mat(vehicles(ii)))) ' mg']);
disp(['EdgeID of veh ', cell2mat(vehicles(ii)), ': ',
num2str(traci.vehicle.getRoadID(cell2mat(vehicles(ii))))]);
disp(['Distance ', cell2mat(vehicles(ii)), ': ',
num2str(traci.vehicle.getDistance(cell2mat(vehicles(ii)))) ' m']);
end

i=i+1;
end

traci.close();

```

4. Important note:

In this code, the port number is 8813.

```

try
system(['sumo-gui' ' -c ' projectPath ' --remote-port 8813' ' --step-length
0.1' ' --start &']);

```

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```
catch err  
end
```

However, the current port number is always defined in +traci/init.m file. Please, check if the same port number is used in your roundabout.m script file. Otherwise your code fails.

5. Start simulation by clicking **Run** or pressing **F5**.
6. Further help on TraCI programming is available on the MathWorks and SUMO websites:
<https://www.mathworks.com/matlabcentral/fileexchange/44805-traci4matlab>
<https://sumo.dlr.de/docs/TraCI.html>