SUMO Visualization with Unity

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Outline

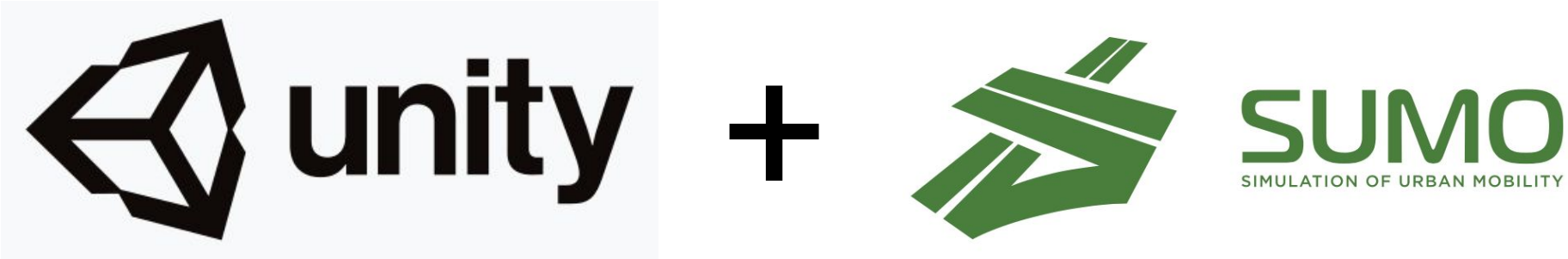
- Introduction
- Implementation
- How to use
- Demo
- Reference

Introduction

SUMO


map.sumocfg - SUMO 1.9.2
File Edit Settings Locate Simulation Windows Help
Time:
Delay (ms):
Scale Traffic:
standard
0 100m

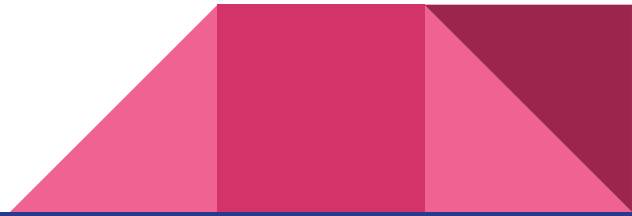
Motivation



Implementation

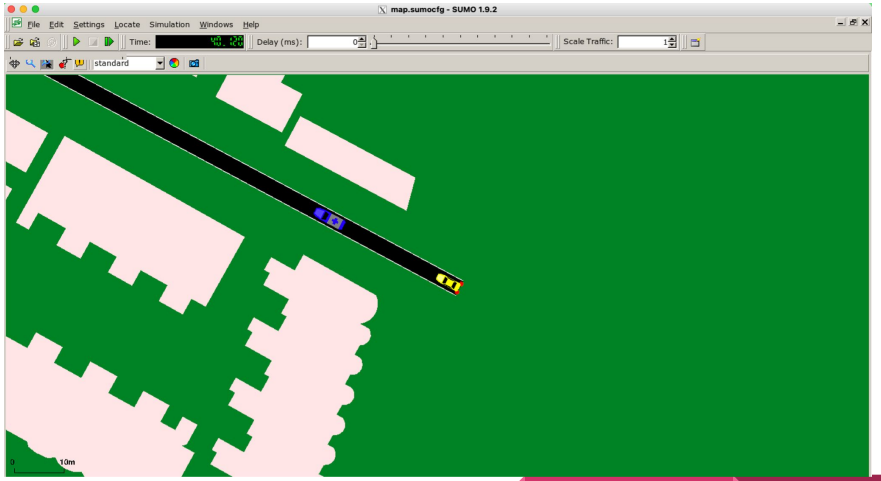
Build the Scene

- Buildings
- Trees
- Roads



Add Objects in Unity and Synchronize in SUMO (1/3)

- Emergency Vehicle

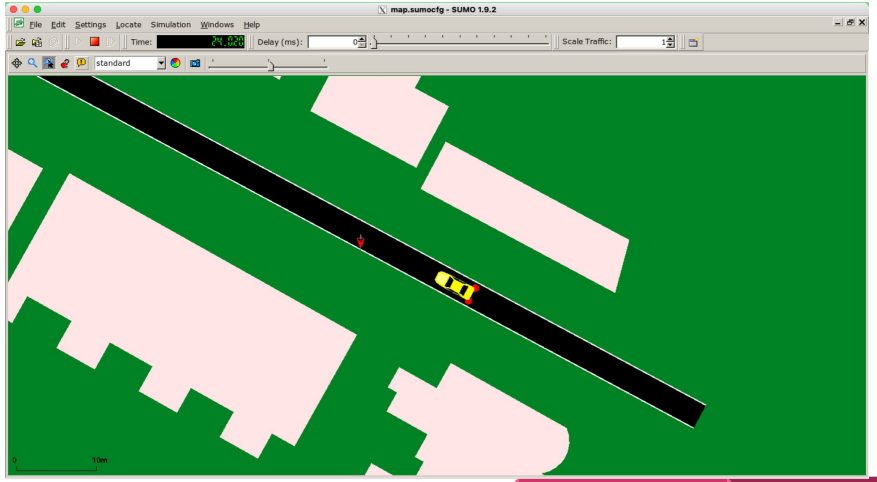


Add Objects in Unity and Synchronize in SUMO (2/3)

- Pedestrian

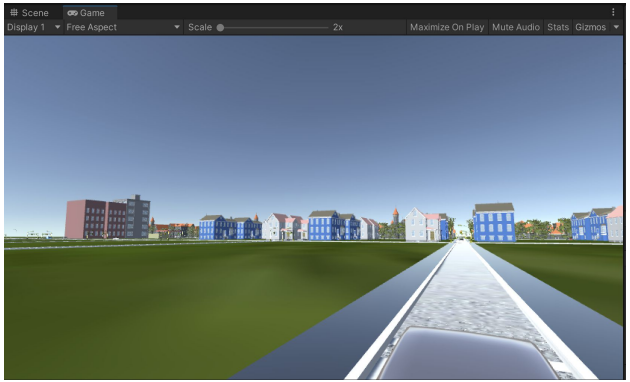
Add Objects in Unity and Synchronize in SUMO (3/3)

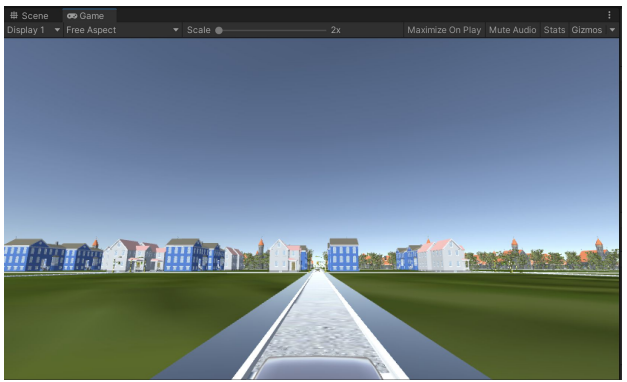
- Roadblock

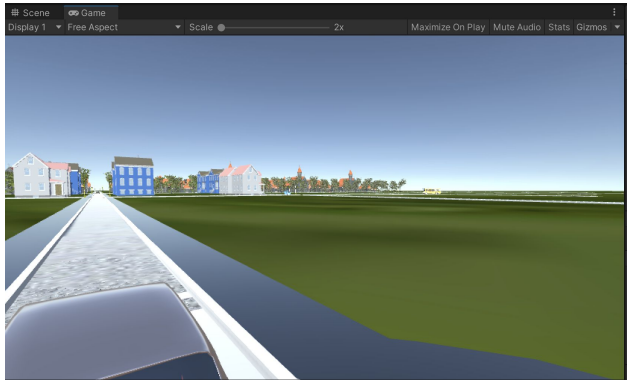


Different viewing angles (1/3)

- First Person View

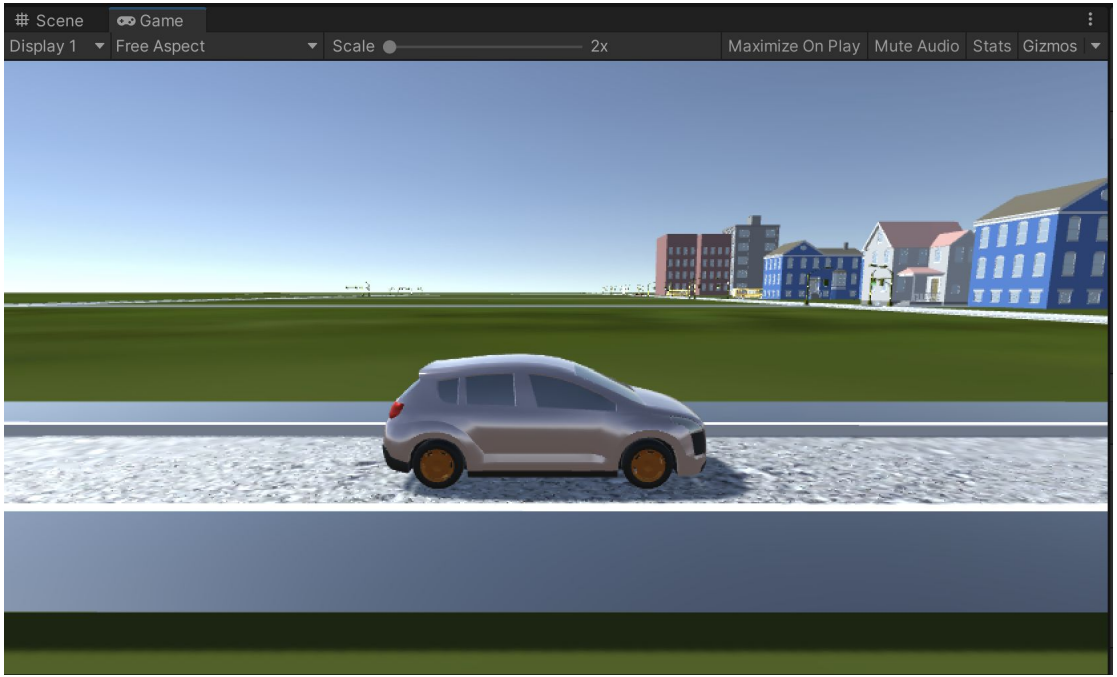






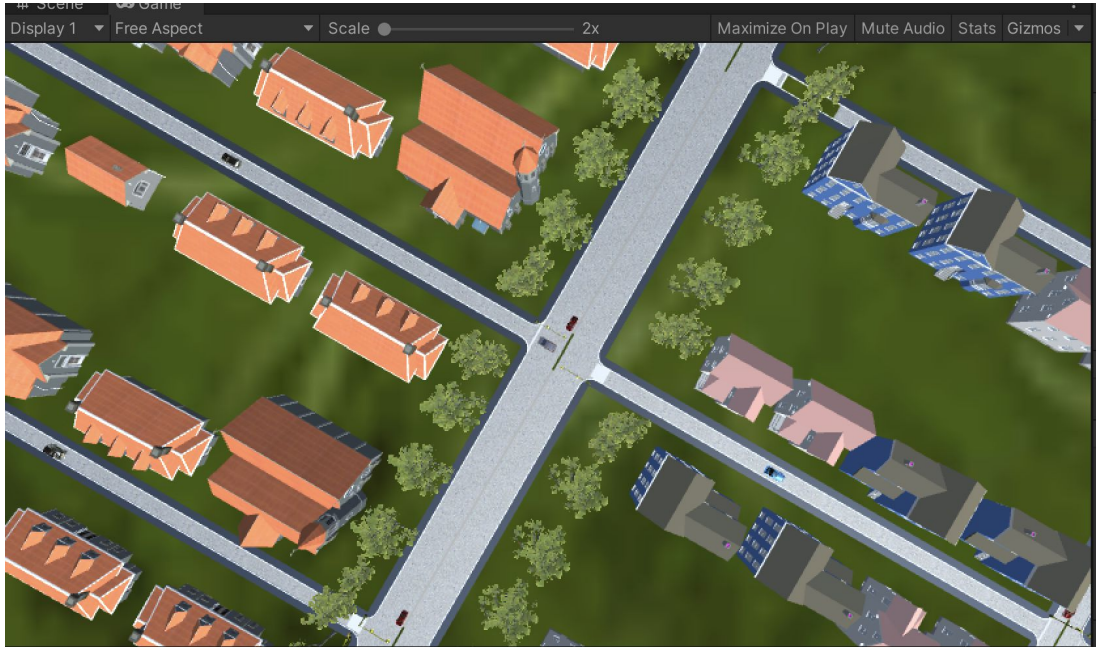
Different viewing angles (2/3)

- Side View



Different viewing angles (3/3)

- Top View



Canvas to Show Information (1/3)

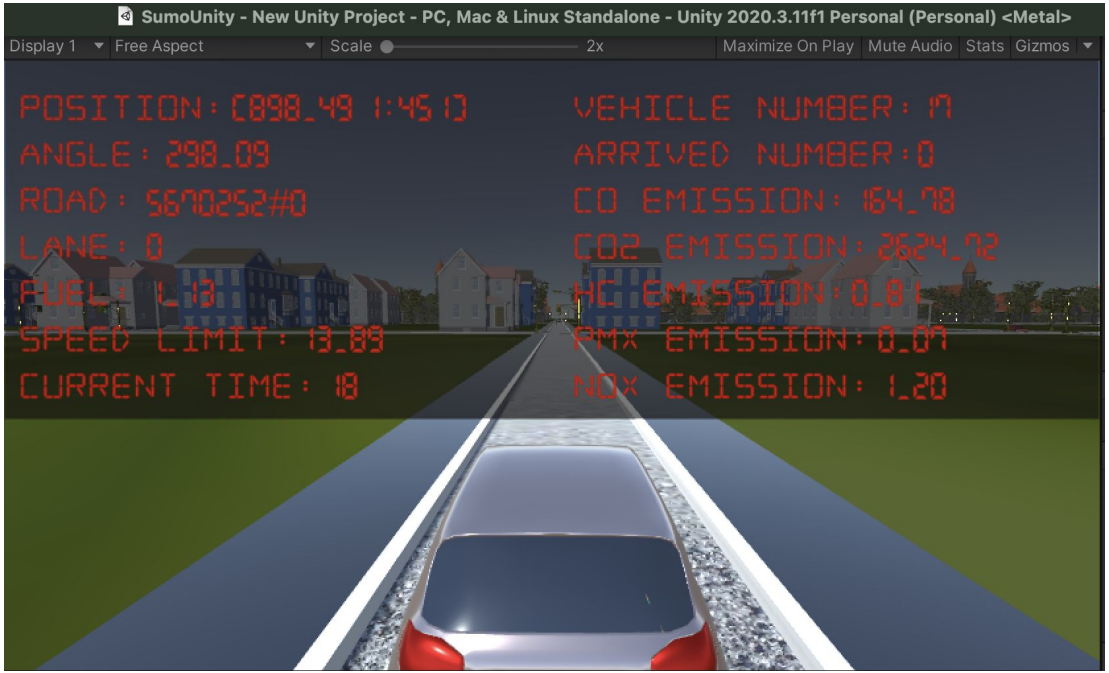
- Dashboard

Canvas to Show Information (2/3)

- Rearview Mirror

Canvas to Show Information (3/3)

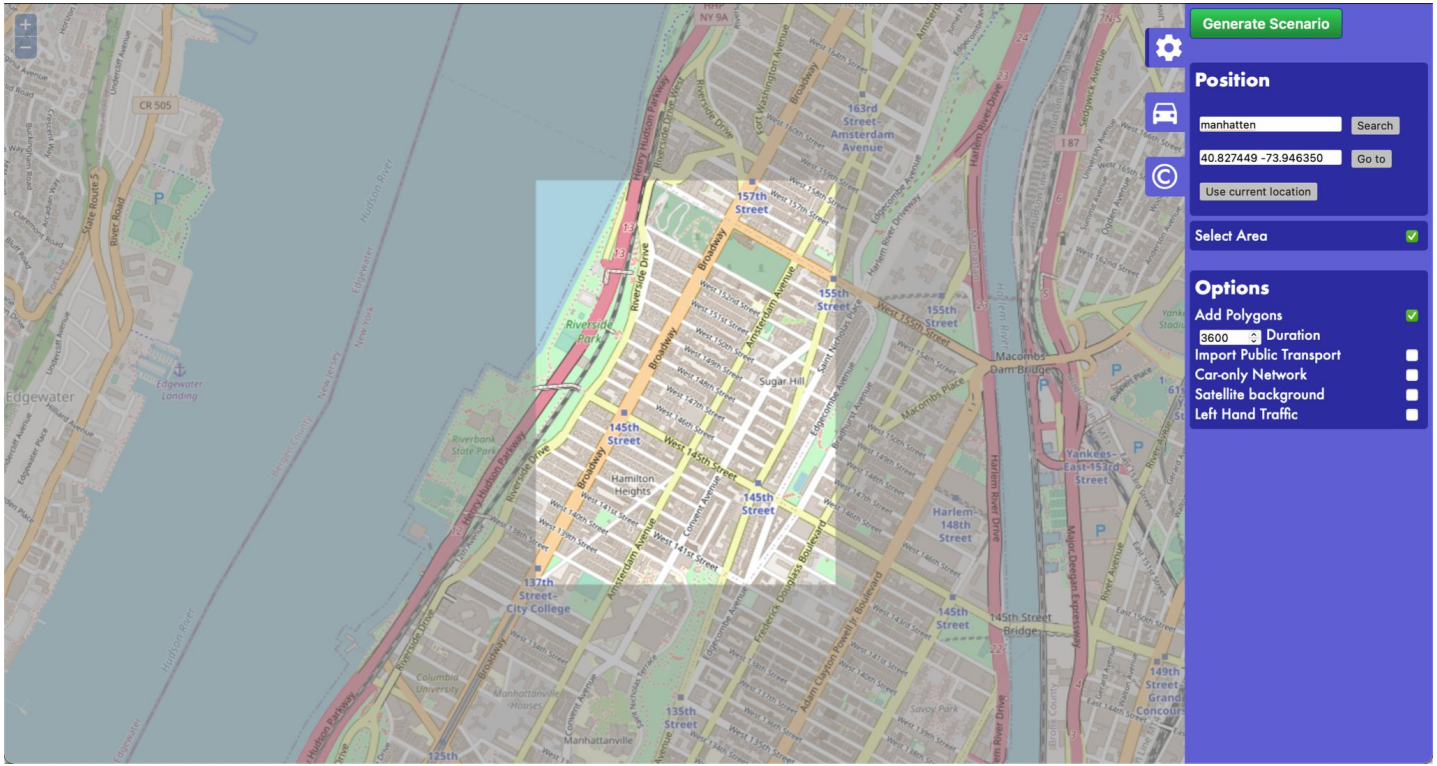
- Other Traffic Information



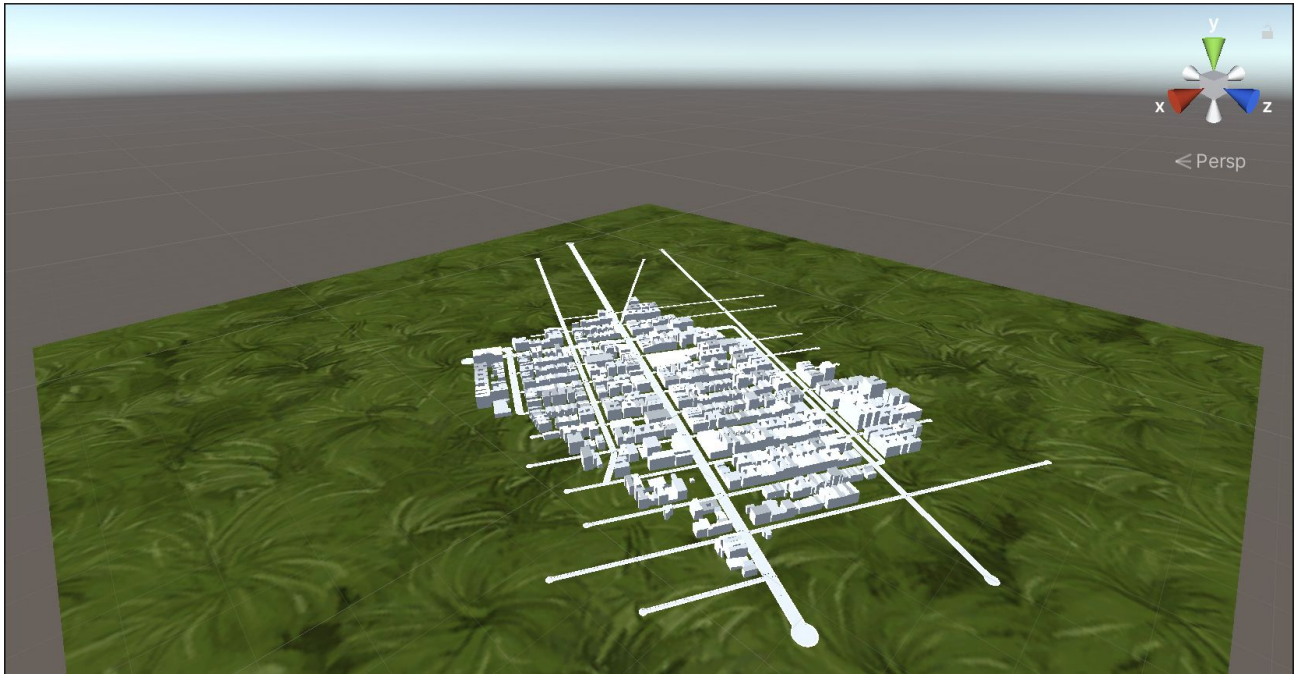
How to Use

Select an Area in OSM Web Wizard and Export the File

- *python sumo/tools/osmWebWizard.py*



Use CityEngine to Generate a 3D Model From the OSM File

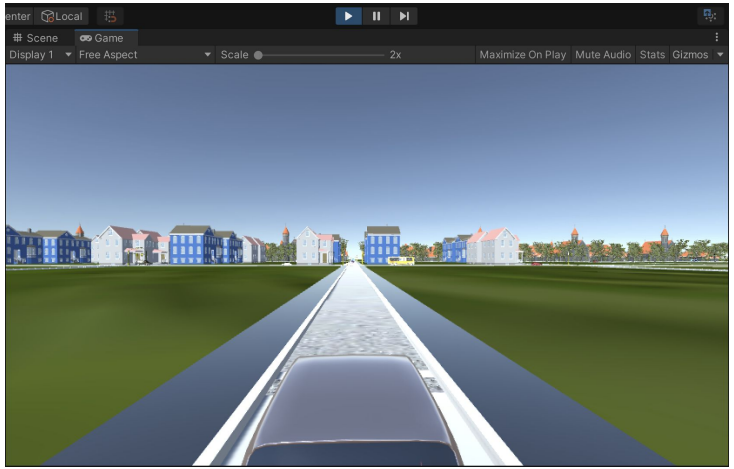


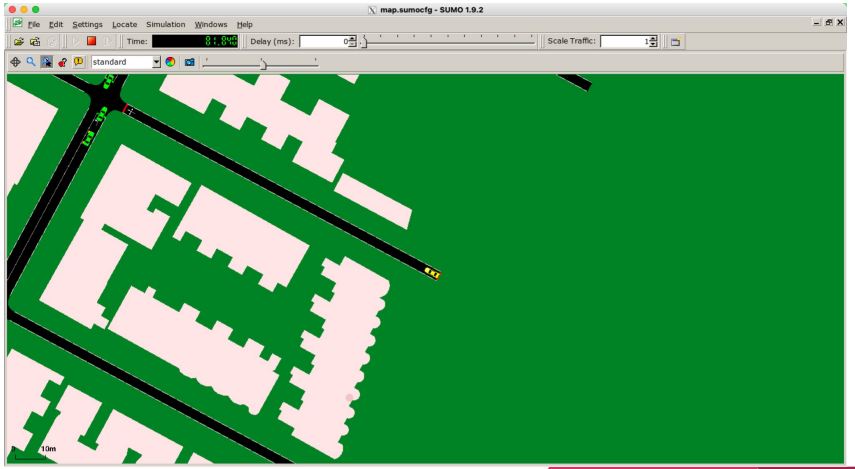
Generate the input data for SUMO

- For net file (.net.xml)
  - *netconvert --osm-files map.osm.xml -o map.net.xml*
- For polygon file (.poly.xml)
  - *polyconvert --net-file map.net.xml --osm-files map.osm --type-file typemap.xml -o map.poly.xml*
- For route file (.rou.xml)
  - *python sumo/tools/randomTrips.py -n map.net.xml -r map.rou.xml*
- Write these files in sumo configuration file (.sumocfg)

Start SUMO Simulation and Click Play in Unity

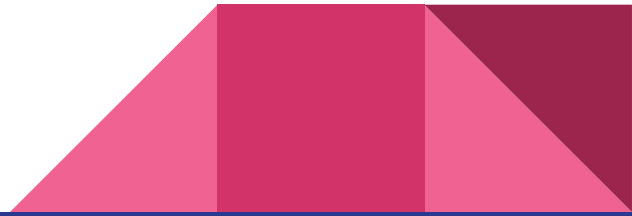
- *sumo-gui -c map.sumocfg --start --remote-port 4001 --step-length 0.02*





Keymap

- Up, Down, Left, Right: Move
- Space: Toggle side view
- 1: Toggle top view
- 2: Toggle dashboard
- 3: Toggle rearview mirror
- 4: Toggle Information board
- Q: Add an emergency vehicle at the position of mouse cursor
- W: Add a pedestrian at the position of mouse cursor
- E: Add a roadblock at the position of mouse cursor
- Mouse: Rotate the viewing angle in first person view



Demo

Video

Reference

- SUMO Documentation
- CodingConnected.TraCI
- Real-time-Traffic-Simulation-with-3D-Visualisation

Thanks for listening!