This is a guide to the files that make up the project and some instructions as to how to run and analyze your own simulations. You can always contact me at [znicolaiscanio@college.harvard.edu](mailto:znicolaiscanio@college.harvard.edu) or [zevnicsca@gmail.com](mailto:zevnicsca@gmail.com).

**Overview of the files**

**edges.edg.xml**

the file with the network edges

**allway.nod.xml**

the file with the nodes for the all way stop sign network

**nodes.nod.xml**

the file with the nodes for the default network

**allway.net.xml**

the network for the all way stop sign made by running ` netconvert --node-files=allway.nod.xml --edge-files=edges.edg.xml --output-file=allway.net.xml`

**net.net.xml**

the default network file made by running ` netconvert --node-files=nodes.nod.xml --edge-files=edges.edg.xml --output-file=net.net.xml`

**network info**

info about the networks written in a human readable way

**xml2csv.py**

utility to turn xml data files into csv data files

**xsd.py**

dependency for `xml2csv.py**`**

**process.sh**

helpful bash script to automate converting a folder of data from xml to csv

**analysis.py**

script to help analyze the results of simulations

**compare.py**

script to compare the results of two simulations

**runner.py**

script to run a simulation

All other files are auto generated.

**Running and analyzing simulations**

This assumes that you have SUMO installed. If not, you should follow the instructions on the SUMO site to install it and set up SUMO\_HOME as an environment variable. You will also need to install NumPy, Pandas, Matplotlib, and Seaborn for Python 3 if you do not have them already. All of the following instructions are meant for Python 3.

First open runner.py and go to the simulation parameters section. Set the parameters to the configuration of the simulation you wish to run (the comments should explain the different parameters and what they do) and run `python runner.py`. The simulation results should now be in the specified folder.

To convert these data files – which are originally xml – to csv for analysis run `./process.sh [folder with raw data] [folder for processed data]` and it will convert all of the xml files to csv files in the new folder for you (the folder must already exist however).

To analyze the processed csv data in a folder you can use analysis.py. First open the file and go to the analysis parameters section. Set the parameters to the configuration of the analysis that you want to run (the comments should explain the different parameters and what they do) and run `python analysis.py`. The script will display two different graphs where the x-axis the probability of a car coming from the north/south appearing at a given time step and the y-axis is the probability of a car coming from the east/west appearing at a given time. The first is of the overall average of the time lost by the cars in the simulation. The second only shows those combinations of traffic density where the average time lost earlier on in the simulation is similar to the average time lost at the end of the simulation i.e. where the amount of time lost is stable.

To compare two different folders of data you can use compare.py. First open the file and go to the analysis parameters section. Set the parameters to the configuration of the analysis that you want to run (the comments should explain the different parameters and what they do) and run `python compare.py`. The script will display three different graphs where the x-axis the probability of a car coming from the north/south appearing at a given time step and the y-axis is the probability of a car coming from the east/west appearing at a given time. The first is of the overall average of the time lost by the cars in the first simulation. The second is of the overall average of the time lost by the cars in the second simulation. The third is of the difference of average time lost in the first simulation minus the average times lost in the second.