ECE 4094

Project A

Progress Report

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Objectives

The objectives of my project is to build an application that has the capablity to display arriving bus times and occupancies for a given bus stop and allow the user to select a bus time that best suits their needs based on given parameters. In order to simulate buses, the program SUMO is being used. This will allow the simulation of buses for a given route and traffic to make the experiment as realistic as possible. The application is being built for an android device. It will be able to connect to a server that is running the simulation so the bus details can be sent across through a TCP socket. This socket will allow data to be transferred from the server to the app and vice versa. Once a user has selected a bus that best suits their needs with the parameters given, they can provide a short description detailing their decision making skills into making that choice. This description with the data will be stored in a database.

Progress to date

Throughout the first semester, progress has been made into the research behind the project and into the software being used. The software being used includes SUMO, Android Studio and a Python IDE. The languages being used are Python for the SUMO code and Java for the application. A quick demo bus route has been tested to see how buses intereact in the SUMO software. There has also been testing of how people interact with buses in SUMO to show how passengers move in the simulation and how passenger numbers are able to be tracked.

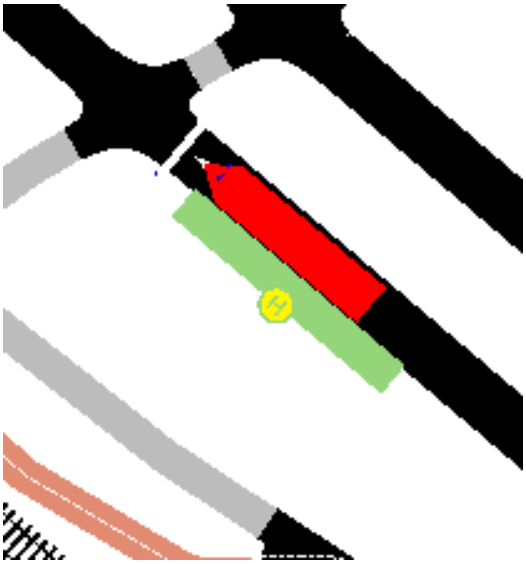

Figure 1: Bus at bus stop

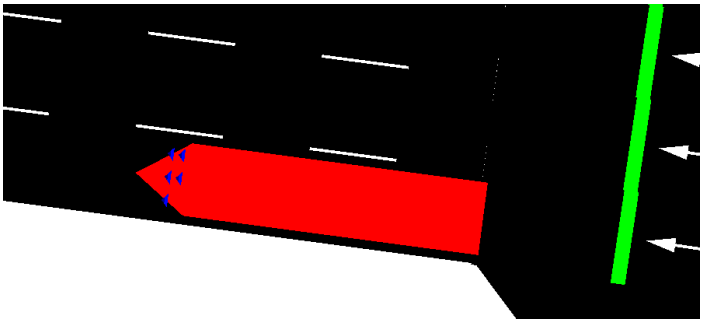

Figure 2: Bus carrying passengers

lane [id]	791849034#5_0
position [m]	11.80
lateral offset [m]	0.00
speed [m/s]	7.21
lateral speed [m/s]	0.00
acceleration [m/s^2]	1.79
angle [degree]	277.57
slope [degree]	0.00
speed factor	1.00
time gap on lane [s]	-1.00
waiting time [s]	0.00
waiting time (accumulated, 100.00s) [s]	15.00
time loss [s]	184.90
impatience	0.00
last lane change [s]	-100.00
desired depart [s]	154.00
depart delay [s]	0.00
odometer [m]	5115.54
remaining [#]	62
insertion period [s]	144.00
stop info	next: busStop:601stop1
line	bus
CO2 [mg/s]	32694.48
CO [mg/s]	48.31
HC [mg/s]	8.40
NOx [mg/s]	249.15
PMx [mg/s]	5.13
fuel [ml/s]	13.94
electricity [Wh/s]	0.00
noise (Harmonoise) [dB]	80.46
devices	person
persons	5
containers	0
lcState right	unknown

Figure 3: Parameters of a bus

```
<route id="601route" edges="679469626#0 679469626#1 679469626#2 679193451 679193452 679469629 4612649 791849036 202904759 763416697#0 763416697#1 763416697#2
  198691699#0 198691699#1 198691699#2 198691699#3 792597607#0 792597607#1 794258388 792597606 573676801 794258389#0 794258389#1 794258389#2 198691696
  794269737 792153597 767369896#0 767369896#1 767369896#2 237508424 139327105#0 139327105#1 167571364 44348023#0 44348023#1 139327110 10539028#0 10539028#1
  493547206#0 493547206#1 807418425#0 807418425#1 807418425#2 815582706 493547204 44348551#0 44348551#1 4707776 165828381 139327106 794265310 776576197
  139327098#0 139327098#1 139327098#2 288985250 784545154#0 784545154#1 784545153 202904794 792597602#0 792597602#1 573676800 794258390#0 794258390#1
  794258390#2 791849034#0 791849034#1 791849034#2 791849034#3 791849034#4 791849034#5 83687002 5229764#0 5229764#1
  791849037 198691695#0 198691695#1 198691695#2 198691695#3 198691695#4 198691695#5 198691798 679469626#0">

  <stop busStop="601stop1" until="10"/>
  <stop busStop="601stop2" until="300"/>
  <stop busStop="601stop1" until="550"/>
</route>
```

Figure 4: Code for making a bus route

```
<personFlow id="BusPerson_0" begin="0" end="9000" personsPerHour="100">
  <walk from="809933538#0" busStop="601stop1"/>
  <ride busStop="601stop2" lines="bus"/>
</personFlow>

<personFlow id="BusPerson_1" begin="0" end="9000" personsPerHour="100">
  <walk from="809933537#1" busStop="601stop2"/>
  <ride busStop="601stop1" lines="bus"/>
  </personFlow>
```

Figure 5: Code for making passengers of a bus

Work to be completed

Most of the work needing to be completed is the python script for the simulation and the development of the application. After this, testing is needed to ensure that all parts are working correctly individually as well as in a group. Once these are completed, the poster and final report are needed. The final report will be worked on throughtout semester 2 while developing the code and the app.Testing will also need to be done once all 3 parts are complete and are communicating with eachother. Figure 6 and 7 below shows the timeline for the project during semester 2, including dates when each section need to be completed by.

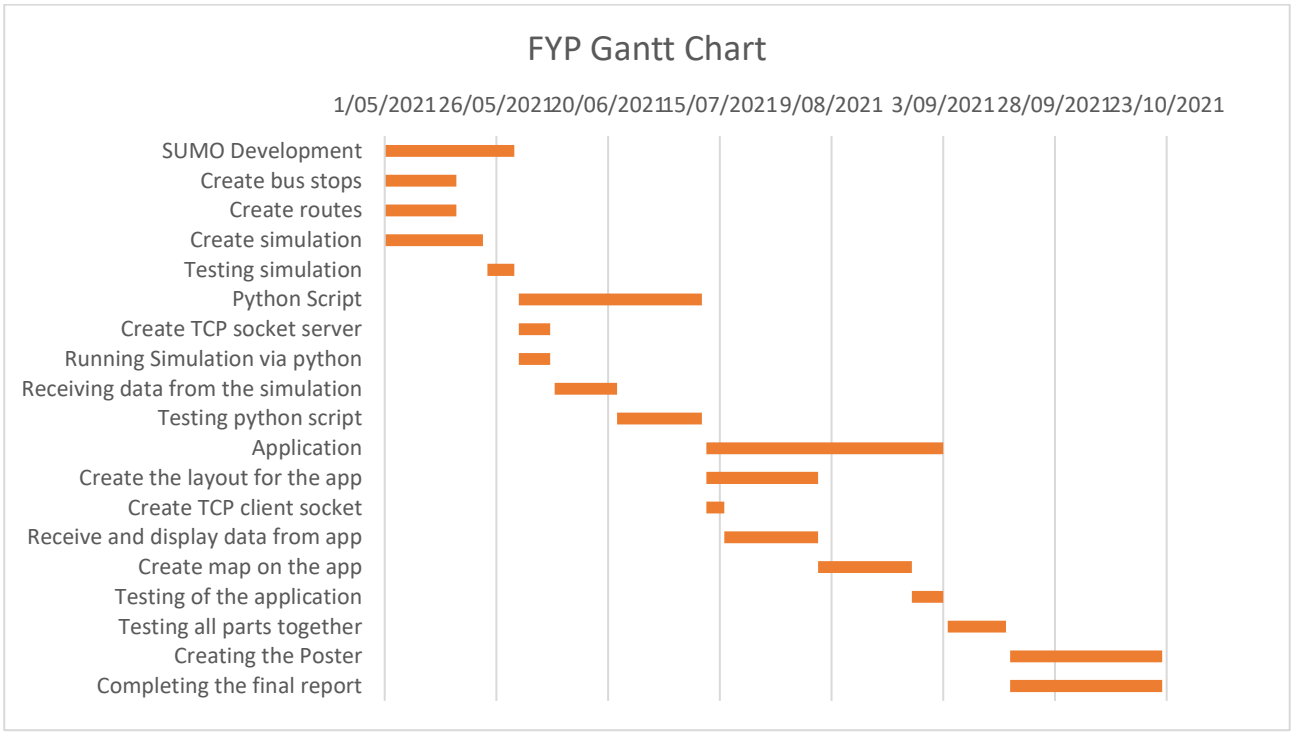

Figure 6: Gantt Chart

Tasks and expected time allotment		
Task	**Expected hours**	**Start week**
Developing the Simulation	3-4 weeks	1st/5/21
Developing the python script	3-4 weeks	31st/5/21
Developing the app	4-weeks	10th/7/21
Testing	4-weeks	16th/8/21
Poster	4-weeks	13th/9/21
Final report	4-weeks	13th/9/21

Figure 7: Timeline of the project